Theses and Dissertations 1. Thesis and Dissertation Collection, all items

1989

The TQM coordinator as change agent in implementing Total Quality Management

Johnston, Larry Wayne

Monterey, California. Naval Postgraduate School

http://hdl.handle.net/10945/27312

NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

J66678

THE TQM COORDINATOR AS CHANGE AGENT
IN IMPLEMENTING TOTAL QUALITY MANAGEMENT

by

Larry Wayne Johnston

June 1989

Thesis Co-Advisors: Benjamin J. Roberts
                         E. Neil Hart

Approved for public release; distribution is unlimited

REPORT DOCUMENTATION PAGE

REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b RESTRICTIVE MARKINGS		
SECURITY CLASSIFICATION AUTHORITY		3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited		
DECLASSIFICATION/DOWNGRADING SCHEDULE				
PERFORMING ORGANIZATION REPORT NUMBER(S)		5 MONITORING ORGANIZATION REPORT NUMBER(S)		
NAME OF PERFORMING ORGANIZATION Naval Postgraduate School	6b OFFICE SYMBOL (If applicable) Code 54	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School		
ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000		7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000		
NAME OF FUNDING SPONSORING ORGANIZATION	8b OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
ADDRESS (City, State, and ZIP Code)		10. SOURCE OF FUNDING NUMBERS		

PROGRAM ELEMENT NO	PROJECT NO	TASK NO	WORK UNIT ACCESSION NO

TITLE (Include Security Classification)

THE TQM COORDINATOR AS CHANGE AGENT IN IMPLEMENTING TOTAL QUALITY MANAGEMENT

PERSONAL AUTHOR(S)
Johnston, Larry W.

13a TYPE OF REPORT Master's Thesis	13b TIME COVERED FROM _____ TO _____	14 DATE OF REPORT (Year, Month, Day) 1989, June	15 PAGE COUNT 154

16 SUPPLEMENTARY NOTATION
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government

17.	COSATI CODES		18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Total Quality Management; Total Quality Control; Quality; Change; Change Agent; Resistance to Change

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

The implementation of Total Quality Management involves a major change, a paradigm shift, in management philosophy. Implementing TQM requires the use of a change agent to act as a catalyst to change the organization.

Interviews with TQM coordinators, and a survey of 143 organizations were done to examine the role of the TQM coordinator. Research identified criteria for selection, and location in the organizational structure. Use of an external consultant in a team concept is examined. Resistance to change and overcoming that resistance are explored. Ways to measure success are discussed.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a NAME OF RESPONSIBLE INDIVIDUAL Benjamin J. Roberts	22b TELEPHONE (Include Area Code) (408) 646-2792	22c OFFICE SYMBOL Code 54Ro

DD FORM 1473, 84 MAR   83 APR edition may be used until exhausted   SECURITY CLASSIFICATION OF THIS PAGE
All other editions are obsolete

☆ U.S. Government Printing Office 1986—606-24.

UNCLASSIFIED

The TQM Coordinator as Change Agent in Implementing
Total Quality Management

by

Larry Wayne Johnston
Lieutenant Commander, Supply Corps, United States Navy
B.S., University of Tennessee, 1974

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
June 1989

ABSTRACT

The implementation of Total Quality Management involves a major change, a paradigm shift, in management philosophy. Implementing TQM requires the use of a change agent to act as a catalyst to change the organization.

Interviews with TQM coordinators, and a survey of 143 organizations were done to examine the role of the TQM coordinator. Research identified criteria for selection, and location in the organizational structure. Use of an external consultant in a team concept is examined. Resistance to change and overcoming that resistance are explored. Ways to measure success are discussed.

TABLE OF CONTENTS

ACKNOWLEDGMENTS

I would like to thank Dr. Laurie A. Broedling and Dr. Steven L. Dockstader of the Naval Personnel Research and Development Center, San Diego, for the inspiration for this thesis topic and for their initial guidance and suggestions.

I would like to thank my wife, Jane, for her patience, support, and encouragement during the long thesis process.

I.   INTRODUCTION

A.   BACKGROUND

1.   The Quality Revolution

There is a revolution going on in management philosophy, and it is a revolution in Quality Management. The revolution in quality management is changing the operating philosophy and the underlying structure of American organizations. The theoretical roots of quality management came from America, but the champions of its practical application and the people deserving credit for its emergence on the world scene are the Japanese. The quality revolution has emphasized quality of product, revolutionized the measures of productivity, and has made the worker's ideas an integral part of improving our organization's daily business.

Competitive pressure from the Japanese has caused many American companies to study Japanese industry for the secrets of their success. While some still credit the Japanese success to different work ethics and other cultural differences, most honest American managers will simply admit the Japanese have been better at managing their people and processes.

Following World War II, many progressive Japanese companies adopted a management philosophy known as Total

1

Quality Control (TQC) to run not only their production lines but for use in every part of their company. The old story of the Japanese toy that broke the first time you played with it is gone and in its place are products with high quality and low cost that are the envy of rest of the industrial world.

Progressive American businesses have seen the effect of Total Quality Control (TQC) and have been incorporating its use into American companies. The list of American companies using the new quality management techniques sounds like a "Who's Who" in American Business: IBM, Xerox, Ford, GM, Hewlett Packard and the list goes on.

The Department of Defense (DOD) has not been immune from the effects of the Quality Management Revolution. The Federal Government is not subject to the competitive pressures for survival that a private business faces. However, the last few years of relatively austere funding have driven the Department of Defense to look for more ways to increase productivity and make their limited dollars go further. Many DOD activities have implemented TQC ideas in different ways. On 30 March 1988, Secretary of Defense Frank Carlucci issued a DOD-wide memorandum calling for the adoption of Total Quality Management (TQM) as a vehicle to attain continuous quality improvements in our operations and to meet productivity objectives. [Carlucci] The difference between TQC and TQM is their emphasis. TQC came first and

emphasizes quality "control" over production functions; TQM evolved from TQC and emphasizes "management" and is applied to every functions in the organization. Today, the two terms are often used synonymously.

There is quite a bit of current literature on Total Quality Management theory and the tools of TQM, but there is relatively little information on how to take this mass of knowledge on TQM and its tools and translate this data into practical application on day one of your TQM implementation. A critical first step is to choose an individual to serve as your TQM Coordinator. The TQM Coordinator will be the key to implementing TQM in your organization. He will also be the catalyst to effect a major change in the way your organization thinks of itself and its way of doing business. He will be the "change agent" for your organization. This concept of the change agent is a major element in this thesis.

A "change agent" is a key individual who administers change in the right amounts, in the right places, and at the right time. Change is essential to organization growth and survival in today's world, but it must be carefully balanced against psychological, social, organizational, political, and other factors to be successfully implemented. A change agent is essential for an organization to make the transition to Total Quality Management.

3

B. OBJECTIVE AND RESEARCH QUESTIONS

1. The Objective

This thesis will explore the role of a Total Quality Management Coordinator as a change agent to implement Total Quality Management (TQM) in both federal and civilian organizations. The objective will be to analyze all the factors related to the TQM coordinator himself. This thesis will explore the humanistic side of TQM. This thesis will provide useful information to organizations just starting in TQM and give new insight to long-time practitioners.

2. The Research Questions

The following specific research questions will be addressed.

a. Primary Research Question

What is the role of the TQM coordinator as change agent in implementing Total Quality Management?

b. Subsidiary Questions

- What traits, characteristics, and qualities are important in a TQM coordinator?

- How is the TQM coordinator selected?

- How does the TQM coordiantor fit into the organizational structure? Where is he placed in the organizational structure. What type of access to top management should he have? Should an organization's structure change to incorporate TQM?

- Does the coordinator work alone, or should an outside consultant be hired? If an outside consultant is hired, how long are they needed?

- Should the TQM coordinator have a staff or work alone?

- What are the sources of resistance to change?

4

- How does the organization overcome resistance to change?

- How is the success of the TQM coordinator measured?

    c. Scope, Limitations, and Assumptions

In order to make this thesis a manageable project, the following scope considerations, limitations and assumptions apply.

(1) <u>Scope</u>. This thesis covers Total Quality Management (TQM) and looks specifically at the TQM Coordinator used to implement TQM. This thesis is not a broad investigation into the theory of Quality Management or the application of the tools of Total Quality Management. It is an exploratory study into the real world role played by the TQM coordinator.

(2) <u>Limitations</u>. The foundation of this thesis is six months of concentrated reading and study of current literature available on Quality Management and Change Agents. It is based on personal interviews with TQM coordinators in both civilian and federal organizations. It also contains information distilled from 143 surveys sent to a wide variety of civilian and federal organizations. This thesis is a scholarly look at TQM coordinators in all types of organizations, not just those in the Department of Defense.

This thesis is not limited to the teachings of any particular TQM expert/guru. It looks more at the implementor himself than the specifics of which TQM theory

he is using. Some people will disagree with using this approach, but I do not believe I have diminished the value of the thesis by doing this.

(3) Assumptions. Although Chapter III of the thesis will provide a brief introduction to Total Quality Management, the thesis is written assuming that most people reading it already understand TQM. Specifically, it does not cover the tools of TQM, such as statistical process control, pareto analysis, or flow charts. There are plenty of references available on these subjects. A person who is just being introduced to TQM should glean a lot of practical knowledge from this thesis, but will have to go elsewhere for more depth on the theory and tools of TQM.

I believe the true significance of my thesis will be the additional knowledge learned about the TQM coordinator that might be of help to someone already embarked on a TQM implementation or someone who has read all the references and is ready to start one. My thesis will be of the most use to individuals who are ready to make the leap from knowledge of TQM to the application of TQM.

II. METHODOLOGY

A. SUBJECTS

The subjects analyzed in this thesis were individuals assigned as quality management implementors. Implementors from both civilian and federal organizations were studied. An effort was made to target only organizations known to be pursuing quality management as opposed to traditional quality control.

B. LITERATURE REVIEW

An extensive review of current literature was conducted for information on both quality management and the concept of the change agent. As much information as possible was collected to get a broad perspective of both subjects. This approach showed what had already been done and avoided duplication in the research.

A manual search of the Naval Postgraduate library was initially conducted using the card catalog to locate books and the Reader's Guide to Periodical Literature for magazines. The Government Reports, Announcements, and Index was also consulted. In addition to finding several good references, this index was most useful in determining the best "key" words for use in the computer searches.

To maximize research time, several computer data services were used to produce abstracts and bibliographies

of material on both subjects. The following databases were
used:

- Defense Logistics Studies Information Exchange (DLSIE).

- Semi-Automatic Bibliographic Retrieval System (SABIRS).

- Defense RDT&E On-Line System (DROLS).

- Dialog Information Services.

- Defense Technical Information Center (DTIC).

- National Technical Information Service (NTIS).

- Old searches held in the Naval Postgraduate School
  library. These included Organizational Development
  (1988), Change Management (1982), Change Management
  (1980), and Change and Resistance (1979).

Using these sources, copies of references that looked
like good candidates were obtained from the school library
or through interlibrary loan.

C.   DATA COLLECTION TRIP

Early in the thesis research, a data collection trip was
made to San Diego. Visits were made to the Naval Personnel
Research and Development Center (NPRDC), Naval Supply Center
(NSC) San Diego, and Fleet Accounting and Disbursing Center
Pacific (FAADCPAC). The trip's purpose was to collect
books, magazine articles, and other data held by these
activities. Interviews were held with two researchers at
NPRDC, and with the quality management implementors at NSC
San Diego and FAADCPAC. The trip produced a lot of material
that would have taken a long time for the researcher to find
on his own. The interviews helped channel the research

objectives and clarify some initial questions on how change agents work and on Total Quality Management.

D. SURVEY

In order to meet the objectives of this thesis, a survey was needed to produce a broad data base. The first step was developing two lists of questions. One list related to quality management and the other related to the change agent. The two lists were then melded into a trial survey.

To test the trial survey, six copies were sent to implementors that had been contacted in advance. They agreed not only to fill out the survey, but critique it also. The purpose of the test was to validate the survey. It was a way to find out any problems with the survey, find out how much time it took to complete, and to verify that the questions were really producing the data needed.

After the six trial surveys were returned, the survey went through a final revision. In any revision, there are tradeoffs to be made. The survey must be long and complete enough to contain all the pertinent questions needed to gather the required data needed. It must not be so long that people will not take the time to fill it out and, instead, throw it away. To be comprehensive, the final survey contained 41 questions and covered nine pages. To make the survey easy to fill out, 30 of the questions had a list of alternate answers that could just be checked off.

The trial survey showed that the survey took 20 to 30 minutes to complete, and this seemed reasonable.

The survey was targeted specifically at organizations known to be using quality management. To develop a mailing list several sources were used. During the current literature search, a list of both civilian and federal organizations using quality management was compiled. Whenever possible, the name of a contact in the organization was added to the list. To specifically target civilian companies, the top 100 companies in the Fortune 500 were also reviewed in Standard and Poors Directory. Any company that listed an officer as the "Vice President of Quality," or similar title, was added to the list. The majority of addresses for federal organizations came from a list of attendees at the Department of Defense Third Annual Productivity Conference, held 3-5 October 1988. Some recommendations for the mailing list were picked up on the initial data gathering trip to San Diego.

Since this thesis deals with both civilian and military organizations, the goal was to obtain approximately the same number of surveys returned from each group. The goal was to get 30 returns from each of the two groups. Based on older theses that used surveys, an overall return rate of 30 to 40% was expected. It was anticipated that more of the civilian companies would fail to return the survey because they would see no benefit in it for them. To get the 60

survey goal, 150 surveys were printed. The final number
mailed was 143. The split was 88 surveys (or 60%) to
civilian organizations, and 55 surveys (or 40%) to federal
organizations. To try to improve the return rate, personal
cover letters were make up for each survey. The cover
letter was a form letter stored in a microcomputer, and the
name, address, first paragraph were personalized. Each
person also received a return envelope with the school's
address on it and their name and address on the corner.
This took considerable time and effort, but it was hoped it
would pay off in a better return rate. The cover letter
also promised to send an executive summary of the thesis
results to each survey respondent. It was hoped this would
be an inducement to organizations to take the time to fill
out the survey.

E. PERSONAL INTERVIEWS

   After reading and studying the bulk of the current
literature collected, a second trip was made to San Diego to
do personal interviews. The purpose of the interviews was
to discuss the ten research questions posed in Chapter I of
this thesis. Interviews were held at the following
organizations:

   - Hewlett-Packard, San Diego Division.

   - General Dynamics, Space Systems Division.

   - Naval Aviation Depot (NADEP) North Island.

- Naval Supply Center (NSC) San Diego.

- Fleet and Accounting Center Pacific (FAADCPAC).

The interviewees were asked essentially the same questions that were on the final survey. Being there in person allowed more in-depth questioning and further exploration of certain areas depending on their responses.

The second trip to San Diego was planned to coincide with a three day TQM Implementors Seminar held by NPRDC. This allowed more to be learned about NPRDC's approach to implementing TQM, and provided an opportunity to meet 23 new implementors who were attending the course.

The preceding research methodology was used to develop a broad background on the role of TQM Coordinators. All the data collected from this independent research will be summarized in Chapter V and analyzed in Chapter VI.

III. TOTAL QUALITY MANAGEMENT

A. DEFINITION OF QUALITY

In any exploration of Quality Management, we must first define what we mean by "Quality." Most people tend to think of quality as a desirable characteristic to have, but if asked to define it, would come up with terms like "an excellent product, carefully manufactured, craftsman built, reliable, or functional." The problem with these terms is they do not provide an objective, measurable definition of quality. Although there is no one exact definition of quality, the following definitions of "quality" are some of the ways it is defined:

- "Quality is conformance to your customer's requirements." [Control Data Corporation]

- "Quality is what the customer perceives." [Feigenbaum 83]

- "Quality is fitness for use, not conformance to specifications." [Juran 51]

- "Giving people what they have the right to expect." [Tribus]

- "The totality of features and characteristics of a product or service that bear on its ability to satisfy (a user's) given needs." [American Society for Quality Control, 1983].

In all of these definitions, quality is defined by meeting customer needs and expectations. Quality is truly defined by the customer. If your product or service meets customer needs and expectations, it is a quality product or

service: If it does not, it is not a quality product or service.

B. DEFINITION OF QUALITY MANAGEMENT

Today's ideas on quality management are an outgrowth of the older concept of quality control. Quality control is defined as "the regulatory process through which we measure actual quality performance, compare it to standards, and act on the difference." [Juran] Quality control has tradition-ally looked primarily at controlling manufacturing production processes. It has put great emphasis on conformance to specifications at the end of the production process. Quality management's aim on the other hand is at providing continuous improvement in every facet of an organization, not solely the production process. [Juran and Gryna, McMillan]

Just as there is no one definition of quality, there are many definitions and labels for quality management. My review of current literature produced a wide variety of names for quality management. The Japanese primarily prefer the name Total Quality Control (TQC). The Department of Defense is using the name Total Quality Management (TQM). Civilian companies in the United States are using both of these names as well as Company Wide Quality Control (CWQC), Quality Improvement Process (QIP), Statistical Quality Control (SQC), Zero Defects (ZD) and many others.

14

Despite the many different names applied to quality management, all address quality in a way different from the traditional definition for quality control. The following definitions are useful to define what we are talking about:

- "Total Quality Control (TQC) is an effective system for integrating the quality-development, quality-maintenance, and quality improvement efforts of various groups in an organization so as to evaluate product and service at the most economical levels for full customer satisfaction." [Feigenbaum 83]

- "Total Quality Management is the application of quantitative methods and human resources to control and improve materials and services supplied by the company, the processes resulting in products and services of the company, and to meet the needs of the customer." [NPRDC Brief] ok

- "Total Quality Management (TQM) is a process for change and improvement in everything: products, services, and all work processes." [Gibson]

- "Company Wide Quality Control is a systematic approach to productivity improvement using objective methods and all employees to continuously improve the quality of products and services." [NPRDC Brief]

- "Broadly interpreted total quality means quality of work, quality of service, quality of information, quality of process, quality of division, quality of people, including workers, engineers, managers, and executives, quality of systems...and objectives. To control quality in its every manifestation is our basic approach." [Ishikawa 85]

For the purposes of this thesis, any of the preceding definitions is valid. All of these definitions of quality management stress using all employees as a source of ideas to continuously improve processes and products to meet customer objectives. The goal of quality management is to achieve a continuous improvement effort that permeates every process, product, and service of an organization.

15

C. THE TOTAL QUALITY MANAGEMENT PHILOSOPHY

Total Quality Management is a management philosophy for running organizations. It represents a new way of thinking about our processes and a new way of managing. TQM is not just another management fad or buzzword. It is not just a process or a tool. It is a new way of life for organizations.

The Total Quality Management philosophy is built on the following concepts:

- Meeting customer requirements is of prime importance. A customer is anyone, either external or internal, who receives the output of an organization's work. Everyone in an organization has a customer. [Control Data Corp; Ishikawa 85; Deming 86; Juran 80]

- Achieving continuous improvement of all processes and products is the goal. Improvement is achieved by reducing the natural variation that is present in all processes and products. TQM emphasizes that improving work methods and reducing rework lead to better productivity. [Taguchi, Ishikawa 85; Deming 86; Boudreaux]

- Making decisions is supported by the graphical and statistical tools of TQM. Changes in processes and products are found by the use of tools such as the process flow chart, cause-and-effect analysis (also known as the fishbone diagram), pareto charts, histograms, scatter diagrams, run charts, and statistical process control (SPC) charts. [Ishikawa 82; Taguchi, Juran 80; Boudreaux]

- Communication throughout the organization is with a "common language" based on facts and statistical data. This common language provides a way to deal factually with problems. [Shewhart, Ishikawa 85; Taguchi, Deming 86]

- Quality is managed. Quality is the job of literally every single person in an organization, from top management to the most junior employee. The TQM philosophy stresses that the key to process improvement is the infinite human potential of an organization's

16

people. The people closest to the daily process hold the knowledge and experience to improve your organizations processes and products. [Crosby 79; Juran 64; Ishikawa 85]

- Processes, not people, are the root of quality problems. In any organization, 85% of the quality problems are due to the process itself and are controllable only by management. Only 15% of quality problems are due to factors inside the system. Causes of poor quality which are controllable by managers working on the system are called "common causes." Causes of poor quality which are the result of factors inside the system are called "special causes." [Deming 82; Juran 64]

- Quality is a product of prevention, not inspection. Quality is produced by real-time employee inspection of their own work and correction of problems as they are found. Continuous improvement of the process produces quality. Inspecting at the end of the production cycle to separate good items from bad items does not produce quality. You can not inspect quality into a product. Inspection can locate products suitable for sale, but it can never produce a quality process. [Shewhart, Deming 82; Crosby 82]

- Quality is a top management responsibility. Quality can not be delegated to a lower management level any more than ethics can be delegated. Top management's active participation is essential to TQM's success. It is action that is important. Top management must "walk what they talk." [Deming 86; Juran 64]

- Seek quality before profits. It is not that profits are not important; they are vital for the continued existence of the organization. It is the realization that profits are a result of providing a quality product or system. Organizations practicing TQM set long term quality objectives in their strategic planning. They make daily decisions that show that quality of production is more important than quantity of production. [Ishikawa 85]

The preceding nine concepts are generally the basis for most quality management programs. The way to profit is summarized by the following chain reaction of quality.

```
┌─────────────────────┐
│  Reduce Input Costs │
└─────────────────────┘
            │
            ▼
┌─────────────────────┐
│   Lower Unit Costs  │
└─────────────────────┘
            │
            ▼
┌─────────────────────┐
│   Increase Profit   │
└─────────────────────┘
            │
            ▼
┌─────────────────────┐
│ Return on Investment│
└─────────────────────┘
            │
            ▼
┌─────────────────────┐
│   Stay in Business  │
└─────────────────────┘
```
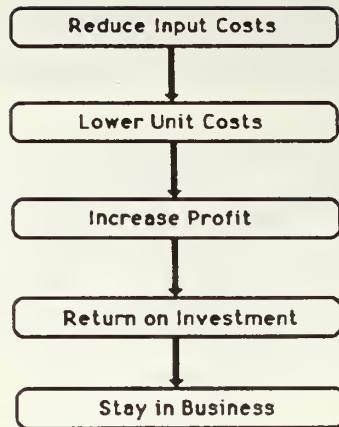
Source: [Hodgson]

D.   THE COST OF QUALITY

In America, managers have long assumed that there was a tradeoff between quality and cost. If costs are cut, quality will inevitably suffer. If more is spent on labor and materials, a higher quality product is produced. This is commonly called the quality-cost dilemma. Quality management does not agree there is a dilemma. TQM says that costs can be lower and quality higher at the same time. This can be hard for American managers to understand. A look at the factors making up the cost of quality will help clarify this. [Suzawa, Crosby 79]

Although the cost of quality is measured differently in various organizations, it is made up of each one of the following costs to some degrees:

- Detection cost--The cost to inspect the final product.

- Error cost--The cost to scrap unacceptable product or to rework it.

18

- Prevention cost--The cost of building quality into the work as it is being done. [Wagel]

- External costs--The costs due to loss of market share, warranty costs, product liability costs, and goodwill. [Jordan]

Traditional American management philosophy has always tried to trade off detection cost versus error costs to minimize the cost of quality in producing a product. The fallacy in this approach is the cost that is the least expensive and most effective is the one too often ignored-- the cost of prevention. [Wagel]

American industry is awakening to the cost of ignoring quality. Non-conformance to the quality the customer expects ends up costing organizations lost sales, rework costs, repair costs, scrap costs, warranty costs, and inspection costs. The amount of dollars lost due to poor quality is staggering. Typical American manufacturers spends 20 to 25% of their operating budgets on error detection and correction. It has been calculated that as much as 25% of the typical American workforce produces nothing. They are absorbed in finding things not done right in the first place and correcting them. [Mishne] Phillip B. Crosby says that the Cost of Quality (the expense of not doing things right) runs 23% of sales in manufacturing companies, and even more in service companies. [Crosby 82] Armand V. Feigenbaum makes this same point but cites even higher percentages. He says that the myth that good quality costs more than bad quality has helped perpetuate the

"hidden factory" which absorbs about 15-40% of total
productive capacity finding and fixing errors. [Feigenbaum
87]

   Total Quality Management focuses on the cost of
prevention. If organizations can establish real-time
control of quality problems in their processes and correct
the problems as they are found, the organization avoids
tremendous costs later on. As organizations strive for and
achieve continuous process improvement, they can begin to
drive down even the cost of prevention. If the organization
can eliminate the 20 to 25% of a typical operating budget
that is currently tied up in error detection or correction,
and still produce the same quantity of output, it has
effectively achieved a 20 to 25% increase in productivity.
It achieves the same output with 20 to 25% less cost. This
is the true essence of quality management. The organization
gets both lower costs and higher quality. [Wagel, Rehder
and Ralston]

   Does this still sound unbelievable? Consider IBM's
thoughts on it. IBM found it cost, on a relative scale,
$1.00 to fix a problem in the design phase, $20.00 during
production, and $50.00 after production ended. [Rehder and
Ralston] To quote Robert Costello, "having good quality
does not cost, it pays." [DOD TQM Orientation] Armand V.
Fiegenbaum summed it up when he said, "Ample experience
clearly shows that higher qualilty means lower cost, that

quality and cost are partners, not adversaries, a sum not a difference." [Fiegenbaum 87]

A final thought on the cost of quality. The external cost of quality is significant, yet it is too often ignored by American management. External costs such as warranty costs and liability costs are hard to project, but easily measured after they occur. The external costs such as loss of market and goodwill are difficult or impossible to measure. However, these external costs must be considered because they are so vital to the long term success of the organization. TQM is concerned with these costs because it strives to truly satisfy the customers need.

E. TQM IMPLEMENTATION FRAMEWORK

There are many approaches to implementing TQM. However, It is beyond the scope of this thesis to explore all of them. This thesis will concentrate on the implementor, not the implementation. However, because it is impossible to wholly separate the two subjects, a general framework for an implementation will be described. It represents a generalized composition of ideas from many sources.

Every organization embarked on TQM has a "champion." The champion is the one with the initial vision to pursue TQM. Often the champion is the CEO/CO or another member of top management. If the "champion" is not from top management, his first job is to make top management aware of

21

organization. They provide strategic direction to overall quality improvement efforts. They target general products or services to be improved. The organization can not work on everything at once. They control the financial, people, and other resources necessary to sustain the quality improvement effort.

2. Quality Management Function

A quality team is composed of managers at various levels below top management. These teams take the general products and services targeted by top management, and decide on specific processes to be improved. They ensure that their people are adequately trained. They monitor results of lower level quality teams and make reports to top management.

3. Process Improvement Function

Process improvement is done by quality teams composed of employees directly involved with a process. Team members can be, and frequently are, from different departments or divisions, and from different levels in the organization. The key is that they all "own" part of a process and have the first-hand knowledge and experience needed to improve both the process and the product or service. They are trained in the tools of TQM, and know how to collect and analyze data. They make recommendations on process improvements to the more senior quality teams.

the need for TQM and sell them on the need for implementing it in the organization.

The next step is for top management to select a TQM coordinator. The TQM coordinator will act as a catalyst or change agent to implement TQM in the organization. He will arrange for the training in quality management theory and the tools of TQM. He will be an advisor to all the levels in the organization. He will be a consultant to all the quality teams which will be established.

The use of teams is critical to implementing TQM. A "team" is composed of all the people involved in a process. The idea behind the team concept is that the team can come up with more effective improvements than a single individual who only sees part of a process. The ability to set up and develop an effective team structure is a key building block for a successful TQM implementation. The techniques behind team building are beyond the scope of this thesis. Those unfamiliar with teambuilding should refer to a book on the subject. One of the most practical is Peter R. Scholtes' Teambuilding, How to Use Teams to Improve Quality.

An organization must form quality teams at all levels. The quality teams at the various levels in the organization perform the following functions.

1. Guidance Function

A quality team composed of the CEO/CO and other top management. They define the mission statement for the

The preceding paragraphs provide an example of a basic structure for implementing TQM. It is important to remember that the exact structure is not important, it is people. An organization that uses the tools of TQM by themselves will not get very far. Organizations must use teams or some other means to create a environment that encourages employee commitment, creativity, and participation in improving the quality of the processes and products. The motivation for using teams is best summarized by Benjamin Franklin when he said "We must all hang together or we will surely hang separately."

F. THE PARADIGM SHIFT OF TOTAL QUALITY MANAGEMENT

The Total Quality Management philosophy represents a fundamental clash with the traditional management philosophy learned and practiced by American managers. The concepts behind TQM and the cost of quality are logical and reasonable. They are proven concepts that work. At the same time, they are difficult to institutionalize as a "way of life." Our traditional management style has been learned from our parents and from the American education system. This style has become ingrained as a way of doing business.

Total Quality Management leads to a total shift in management philosophy. When first introduced to the concepts of Total Quality Management most American managers appreciate the logic and the obvious benefits. Many get enthusiastic and decide to implement TQM in their

24

organizations. The initial implementation efforts usually give way to a sobering realization that TQM represents a total shift in management philosophy. This shift is of such magnitude that it is best described as a "paradigm shift." A paradigm is a pattern or set of rules that establish fundamental limits and boundaries on the way we look at things, the way we think, and the way things are done. The problem with a paradigm is if too many of the changes conflict with our previous learning and experience, they are hard to assimilate. A paradigm is a total shift in that pattern. The reason why TQM is a paradigm is because the side-by-side comparison with traditional management philosophy is so glaringly different. It is a total shift in culture. [Dimitroff, Hepler]

The effort required for an organization to make a paradigm shift is immense. To illustrate this point with an example, imagine a person who has been overweight and sedentary throughout life. Assume that person somehow gets the inspiration to lose weight and become athletic. Just as with TQM, it is a logical goal and there is plenty of advice on how to do it. The stores are running over with diet books and there are a lot of "expert" consultants ready to help. However, a person must change a lifetime of eating habits and pick up a completely new exercise habit. It is easy to get enthusiastic and do this for awhile, but it is incredibly difficult to stay with it and institutionalize it

25

as a way-of-life. It is all too easy to quit, get

frustrated, or slide back into old habits, as anyone who has

tried to lose weight can attest. Now multiply the effort

required to successfully make this diet and exercise shift

by the effort required for hundreds of people to make a

similar cultural shift and you get an idea of the degree of

difficulty the paradigm shift to TQM represents.

To help explain how this paradigm shift affects the

various aspects of our management style, this thesis will

contrast traditional American management philosophy with the

TQM philosophy. This comparison is based the applications

of TQM observed during thesis research. As you consider how

the following aspects of traditional management compare with

the TQM philosophy, ask yourself which style of management

you currently endorse and practice, and you will begin to

see the dimension of change represented by TQM.

1. Change in Top Management Emphasis

The top managements in American companies have

traditionally emphasized marketing and finance. They know

how to "make money." They are interested in return on

investment (ROI), and selling what they make. They

understand the processes that produce their product only at

a macro level. They are from the school of "I can manage

anything without knowing the product or technical side." By

contrast, top management emphasis in companies with long

experience in TQM is on the technical and humanistic side.

They are interested in satisfying customer needs by constantly improving the organization's processes and products. They believe in participative management and use teambuilding. Their background is usually from line organizations which produce the company's main product. They truly know the company's products and processes.

2. Change in Organizational Structure

The traditional American organizational structure is a hierarchy composed of many layers. TQM organizations tend to reduce the layers of management, particularly middle management, and become a flatter organization. This has been particulary true in Japanese companies with long experience in TQM. [Ishikawa 85; Imaizumi]

3. Change in Goals

Currently, in most American organizations, each division has individual goals toward which they strive. These goals are often contradictory, leading individual divisions to suboptimize. Competition between divisions is encouraged. In TQM, all divisions work to support a common company goal. Cooperation between divisions is stressed, not competition.

4. Change in Production Orientation

Overall traditional management is volume oriented. Success is measured by the number of items produced. There is an allowable percentage of defective items that can be sold. TQM is quality oriented. The goal is to continuously

improve all processes and products. Units are sold with the belief that virtually no defects exist. The idea of an acceptable defect level does not exist.

5. Change in Operational Goal

The operational goal in traditional American management is cost minimization/profit maximization. In TQM, the operational goal is to improve quality and productivity, and profitability will naturally follow.

6. Change in Products

The old attitude is that products are made to be sold. There is relatively little concern if the products truly satisfy the customer need. In fact, products are knowingly sold that have planned obsolescence built-in. Under the TQM philosophy, products are made to truly satisfy customer needs and expectations. Products are made for long, trouble-free lives.

7. Change in the Responsibility for Quality

In the United States, quality has been long viewed as a manufacturing problem, and the quality control division has the responsibility to maintain quality. Under the TQM philosophy, quality is a company-wide concern. Quality is everyone's responsibility, literally from the CEO/CO down to the janitor.

8. Change in the Importance of Quality as a Goal

Traditionally, quality has been a subgoal. It has been subordinate to return on investment, market share or

other quantitative measures of success. Under the TQM philosophy, <u>quality is the goal</u>. The pursuit of quality will lead to improved productivity, greater return on investment; and greater market share.

9. <u>Change in Vision</u>

Short-sighted vision has been a problem in our current business philosophy. The concentration is on "how do Wall Street investors view us in the short run?" This orientation leads to creative accounting, over emphasis on financial manipulations, and uses of resources that make poor sense in the long run. Under the TQM philosophy, the vision is long term. If the organization serves its customer's needs well today and plans its investments to best serve the future customers, it will not only survive, it will prosper and grow. The TQM organization must be financially viable, but it is not driven or obsessed with the financial side. It is driven by quality.

10. <u>Change in Concept of Quality Control</u>

Quality control has historically been oriented to the inspection and correction of defects. Final inspection separates the good product from the bad. The cost of quality is minimized by balancing the cost of inspection versus the cost of correction. Under quality management, the orientation is to real time control of processes to immediately correct any problem. The emphasis is on defect prevention. The cost of quality is almost entirely the cost

of prevention. The difference in TQM and traditional
quality control is akin to the difference in preventative
medicine and curative medicine.

   11.   Change in Quality and Statistical Training

        In a traditional American company, only the quality
control division personnel receive training in quality
theory and how to apply statistical controls to processes.
The statistical training focuses on lot sampling and the
acceptable quality level (AQL). Statistics is not only
virtually unknown to the rest of the company, it is alien.
Under the TQM philosophy, everyone in the organization is
trained in basic quality management theory and in the
relatively simple concept of statistical process control
(SPC--see Appendix C for a brief explanation). Naturally
the training is more extensive as you move up the chain of
command. However, the point is that everyone understands
the basis of quality and can use SPC to improve their own
daily work.

   12.   Change in the Areas Covered by Quality Control

        Quality control is applied in manufacturing areas
almost exclusively. Under TQM, quality management applies
to every function in the organization. Everyone has a
customer to please. Many "customers" are internal because
any person who receives the output of another person's work
is a customer.

13. <u>Change in Vendor Relations</u>

Supplies have historically been purchased from the lowest bidder. Price is the overriding consideration. The vendor relationship is adversarial and short term. Quality demanded is conformance to specifications. Under the quality management philosophy, vendors are chosen for the quality and consistency of their product. Material is generally received with evidence of Statistical Process Control attached, indicating that the process that produced the product is "in control." Vendor relationships are long term and friendly. Major companies help their suppliers with technical assistance and cooperation. Vendors, knowing that they have a long term commitment, have the incentive to invest in the best possible resources to improve their processes and products.

14. <u>Change in Inspection of Supplies</u>

Under traditional management philosophy, random statistical sampling of incoming vendor material, or even 100% sampling, is used to weed the good from the bad. The belief is that inspection of vendor material can prevent rejects down the line. Under TQM, vendor material is purchased with the proof of statistical process control attached. If a vendor can prove he used this approach, the need for incoming material inspection is eliminated. With defect rates measured in parts per million, Acceptable Quality Level sampling is useless. Vendor material goes

31

straight from the loading dock to the assembly line. There
are virtually no rejects during production. Quality in,
quality out.

15. Change in Attitudes Toward Workers

Workers have too often been viewed as another
component of the production line. Workers must be carefully
policed and managed to ensure compliance with the standards.
Management knows best. Too often there is an ingrained
distrust and disregard for workers and their ideas. Workers
are viewed as maximizing personal benefits at the
organization's expense. Absenteeism and sick leave abuse
are assumed and commonplace.

Under TQM, the workers are viewed as the greatest
source of improvements. The people closest to the process
have the knowledge and experience to continuously improve
the organizations product and processes. People become
committed when they feel they can make a difference. They
are committed to an organization that they are proud of.
Workers that are responsible for and inspect their own work,
produce quality work. Worker participation and involvement
lead to a feeling of "ownership" of their work. Workers
care about the quality of their processes and products and
will take the initiative to make improvements if they are
managed correctly. Absenteeism and sick leave abuse are not
a problem when workers feel like they are an important and
respected part of the business. [Pascarelli]

If this last part sounds a little unreal, consider the case of the GM-Toyota joint venture at the New United Motor Manufacturing, Inc. (NUMMI) plant in Fremont, California. When the plant was operated by GM, it was the least productive plant GM owned. Labor relations problems were so bad that the plant was simply shut down. Since it was reopened as a joint venture using the TQM philosophy to manage people, it is now GM's most productive plant. The amazing fact is that Toyota rehired 85% of the same workers. [Rehder and Smith]

16. Change in Monitoring of Final Product/Output

Under traditional management philosophy, the final product must go through random statistical sampling, as a minimum, to ensure quality prior to being sold. Under TQM, the final product is ready for sale. Continuous real-time process improvement can lead to defect levels measured in parts per million. Final product inspection is not economically worthwhile or required since error rates are so minute.

17. Change in the Quality of Process

Historically, the quality of the product has been assured by inspection of the final product against a standard to weed good product from bad. Quality of the product has been assured, but quality of the process has often been poor. Under TQM, the quality of the process is

emphasized and continually improved. Quality of the process creates quality of the product.

This comparison of the paradigm shift of TQM has frequently mentioned the words "product" and "production line." Most of the points are equally applicable to a service organization or to improving all functions of an organization.

This chapter has covered a brief introduction to TQM, an implementing structure for TQM, and the paradigm shift to TQM. It is not meant as an exhaustive dissertation on the theory of TQM or the ways to implement it. This chapter serves to explain the management philosophy that the TQM coordinator, as change agent, must emphasize.

IV. CHANGE AGENT

The primary research topic of my thesis is how the TQM
coordinator acts as a change agent to implement Total
Quality Management. This chapter will provide a background
on change, change agents, resistance to change, and ways to
overcome that resistance.

A. CHANGE

Change is inevitable. Change is a natural process that
occurs in all organizations. Rates of change vary, but no
organization is truly static. Change is a vital, creative,
energizing force. Change is defined as "the physical and
mental process of making something different in some
particular way, either radically in form or composition, or
in more subtle ways." [Brueland] Change has also been
defined as "the process or act of altering something that
already exists." [Menkus] Both of these definitions relate
change to something already existing. On the other hand,
Rosabeth Moss Kanter defines change as something remarkably
close to innovation when she says "change involves the
crystallization of new action possibilities, (new policies,
new behaviors, new patterns, new methodologies, new
products, or new market ideas) based on reconceptualized
patterns of the organization." [Kanter] A very practical
definition of change which is easy to apply is "doing

35

something better or different, or doing more of what works and less of what doesn't work." [Pascarella]

Change is essential to organizational survival today. Change can be a reaction to the ever changing external environment or to self-generated internal changes. All change is not progress. Change must be planned and carefully controlled for the good of the organization. [Margulies and Wallace; Menkus]

B. THE CHANGE AGENT

Although minor changes to an organization often occur spontaneously, major changes must be channelled and controlled to be both constructive and productive. Major changes do not normally occur spontaneously. Major organization changes are best controlled by a change agent. A change agent is a key person who acts as a catalyst to administer change in the proper amounts, in the right places, and at the right times. [Grossman] Rosabeth Moss Kanter prefers the name "change masters" and defines them as "those people and organizations adept at the art of anticipating the need for, and of leading, productive change." [Kanter] The difficulty in managing a major change is nicely articulated by Niccolo Machiavelle when he said, "There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things."

36

C. ROLE OF THE CHANGE AGENT

The role of the change agent in bringing about the desired organization change is broad. The change agent must accomplish the following:

- Understand the desired end result of the change effort.

- Understand the current organization and its processes.

- Have a vision in his head toward which he is constantly working.

- Create awareness of the need for change in all levels of the organization.

- Prepare the organization's people for the change.

- Build commitment to change and involvement with the change. Commitment and involvement are key to individuals having "ownership" of the change.

- Be able to use the resources provided to him, such as people, time, money, information, and equipment, to accomplish the change.

- Understand the players involved in the change including their attitudes, beliefs.

- Be aware of other social and political factors.

- Get the organization's people involved in planning the change, doing the implementation, and resolving the issues created during the change effort. [Brueland]

The change agent must be a catalyst who acts as a free agent to assist the organization in making a change. It is important to be able to channel the change effort without appearing to be in charge of the change. A mastery of the socratic method of questioning is essential. This means leading others to a conclusion he has already reached and urging them on to excitement and enthusiasm for the change. He would like them banging on the table with conviction.

37

The change agent himself should not be banging on the table or leading the group's effort. The TQM coordinator must avoid becoming a leader of the group, or worse, a cheerleader to the group. He must remain a catalyst who initiates the change and controls the reaction without himself becoming a direct participant in doing the change. [Atkinson]

D. TYPES OF CHANGE

The change agent will encounter two basic categories of change. The first is planned change. Planned change is the conscious, deliberate effort that the change agent and the organization makes to achieve an objective. The other type of change is unplanned change. Unplanned changes are the inevitable changes in an organization due to external environmental forces. Unplanned change is also generated as a reaction to the planned change. Unplanned change is often a result of an organization's resistance to change. [Lippitt] Change, whether planned or unplanned, can also be categorized as technological change or as social change.

Technological change is the effect on an organization's processes, procedures, equipment, products, and services. Technological change is the logical, rational, and usually well-planned change that is done to benefit the organization. Although technological change can cause far-reaching implications, it is mild compared to social change. People can understand technological change on a reasoning

level. People generally have little emotional response to technological change. [Juran and Gryna]

Social change is the effect on the people of an organization. Social change depends on the prevailing "culture" in an organization. "Culture is a body of learned behavior, a collection of beliefs, habits, practices, and traditions shared by a group of people." [Juran and Gryna] Social change is difficult to predict because it reaches people on an emotional level. People have an emotional response to change based on the organization's culture and their own attitudes. The more radical a change is compared to the existing culture's pattern of habits, beliefs, and traditions, the more resistance will be generated.

E. RESISTANCE TO CHANGE

Resistance to change should be expected and welcomed. Resistance to change is a natural response from people undergoing change. When a change agent presents a new idea and meets no resistance, it is not a sign of success. It is a sign of failure. People who offer no resistance are also offering no acceptance of the change. They are showing that they have already decided against the change and will try to "ride it out" using their current method of doing business and hope the change will never take hold or simply go away with the next CEO/CO. [Brueland]

The reasons for resistance to change are a complex mixture of interrelated human, organizational, and technical

issues. There is never a single "villain" to be identified and countered. A change agent must look at the total situation. [Hill] There is no all-inclusive list of factors. However, a change agent should certainly consider the following reasons why people resist change.

1. Concerns for Economic Security

People must earn a wage to survive. Any change which appears to threaten a person's source of livelihood will be resisted. [Caruth]

2. Concerns for Job Status

Changes within organizations frequently alter the hierarchy of positions, reporting relationships, and affect the "symbols of status." Status symbols are those incident rights and privileges that go with a position. They can be an important indicator of one's worth. If a person feels his relative position or status in the organization will be less, he will resist the change. [Caruth; Frick]

3. Disruption of the Social Culture

People satisfy many of their social needs at work. If a person perceives the change will upset the social group that he currently enjoys, he will resist the change. The culture of an organization is a powerful source of resistance that must be carefully considered. [Caruth]

4. Concerns for Job Complexity and Difficulty

Most changes require a period of relearning and adjustment to new procedures. People resist learning

something new, especially if it appears more complex or
disagreeable than their old job. [Caruth]

When the change agent considers the previous four
reasons why people resist change, it is important for him to
remember that almost all resistance to change has its roots
in a single cause--fear. Resistance to change is spawned by
fear. Fear is everywhere. People fear learning something
new. People fear for job security. People fear for their
prestige and position. Change erodes experience. "It can
make apprentices of craftsmen." [Brueland]

How people resist change can take on many forms,
both overt and covert. Overt resistance ranges from simple
honest questioning to outright aggression or violence.
Examples of overt resistance include verbal attacks and
people trying to disrupt or destroy a new system. Overt
resistance also includes people who quit an organization
rather than conform to the change. Covert resistance is
subtle, underlying resistance. Sources of covert resistance
are hard to locate because people who practice covert
resistance put on a front of supporting the change.
Examples of covert resistance include personnel who spread
rumors, people who agree with a change in principle but
never put it into practice, people with a "hidden agenda," a
lack of openness about the current status of a function in
an organization, or an unwillingness to commit adequate

financial and personnel resources to make a change
successful. [Caruth]

F. OVERCOMING RESISTANCE TO CHANGE

A change agent must overcome both overt and covert
resistance to change. He must know the organization and
it's social culture, and be able to predict sources of
resistance based on that knowledge. Developing a plan that
anticipates resistance, and includes ways to reduce or
overcome it is vital to success of the change effort.
[Margulies and Wallace; Management Review 72]

There are many ways to overcome resistance. In my
search of current literature, the following approaches
appeared most often:

- Make people aware of the need for change. People must
  be convinced there is a genuine reason to make a change.
  You must sell your change both logically and
  emotionally, or it will be difficult to implement.
  [Juran and Gryna]

- Involve people in planning the change. People are more
  willing to accept changes that they had a hand in
  planning. Involvement leads to commitment. Commitment
  leads to "ownership" of the change. You want the people
  of the organization to say "we're making a change," not
  "they're changing things." It is particularly important
  to involve the influential opinion leaders from the
  informal social structures that exist in every
  organization. [Caruth; Juran and Gryna]

- Use open, honest communication. The people in the
  organization should be kept fully informed about the
  change, the implementation plan, when, where and how it
  will be implemented, what requirements the new change
  will impose, and what benefits will accrue and to whom.
  In addition to stressing the positive features of the
  change, the people must be honestly informed of the
  disadvantages, problems, and difficulties of the change.
  No plan is all good or all bad. Nothing is black or

white. Give people both sides of the change. Although
open and honest communication will not eliminate all
resistance, the lack of it is a serious mistake and will
certainly intensify resistance to the change. [Caruth]

- Make sure organizational reward, punishment, and
appraisal systems are consistent with the planned
change. Monetary reward and the lure of promotion are
strong motivation factors. They must be congruent with
the change and support it. [Caruth]

No matter how hard the change agent tries, resistance to

change can never be completely eradicated. However, it can

be greatly reduced with proper planning and execution. An

important point to remember is that some people will resist

change no matter what you do. However, most people can be

won over. People tend to balance the benefits and

advantages of change versus its costs and disadvantages.

True resistance is the result of a negative judgement made

about the change. An effective change agent will overcome

resistance by ensuring that people understand that the

advantages truly outweigh the disadvantages.

G.   INTERNAL VERSUS EXTERNAL CHANGE AGENTS

When contemplating a change effort, an organization's

management will frequently wrestle with the choice of who to

select as the change agent. Many organizations pick a

highly competent member from inside the organization.

Other organizations hire an outside expert to handle their

change effort. These people technically known as an

internal and external change agents. There are merits and

problems with both approaches.

43

The use of an internal change agent brings many advantages. During my current literature search, the following are some of the advantages most frequently cited:

- Knowledge of the organization's structure, processes, products, and the way it operates.

- Familiarity with the informal structure, its opinion leaders, and where the strategic leverage points are.

- Understanding of the organization's culture, and its values, norms, beliefs, attitudes, and accepted behaviors.

- Ability to speak the organization's language.

- Power in the formal organizational structure.

- Access to sources of organizational information, and to his peers.

- Identification with the organization's needs and aspirations.

- Understanding of the politics of the organization. He knows who to talk to, when to talk to them, and how to approach them.

- Prosperity of the internal change agent is tied to the prosperity of the organization. [Gluckstern and Packard; Margulies & Raia; Margulies and Wallace; Atkinson]

However, for all his advantages, an internal change agent also has some limitations. The same familiarity with the organization that was his strengths is also the roots of his shortcomings. The following are some of the limitations of an internal change agent:

- May not be sufficiently detached from the situation to be objective.

- May not have the big picture, especially if he is selected from one particular part of an organization.

- Subject to peer pressure to maintain the status quo. He will find it difficult to redefine established ongoing relationships.

- Hindered by past images. He must live down previous failures and overcome hostility generated by previous successes.

- Can be biased toward one viewpoint or simply have "an axe to grind." He will be suspected on having a "hidden agenda" that benefits himself or his old department.

- May lack independence, freedom of movement, and adequate time if he retains any of his old job responsibilities.

- Controlled by the organization through his need for job security. His future career and promotions prospects are at stake. He must always consider the organization's reward and penalty system.

- Usually Lacks of knowledge and experience in his new position. This is his most severe limitation. As a change agent, he may have no training in organizational development, teamwork, and group dynamics. He generally has no practical experience with other change program efforts. [Gluckstern and Packard; Margulies & Raia; Margulies and Wallace; Atkinson]

The foregoing disadvantages often lead management to conclude an external change agent is the more appropriate solution. The external change agent is appealing for the following reasons:

- A fresh perspective is obtained.

- The opinion of an outsider is more objective.

- Independence from the organization's normal sanctions and rewards allows him to take greater risks and push the organization for faster change.

- Experience and knowledge from past change efforts is available. He can an expert in organizational development, teamwork, and training.

- His expert power that builds respect and inspires confidence.

45

- The outsider is not seen as having a vested interest or an "axe to grind."

- An extensive background in research and an active research orientation is brought to the change effort.

- Commitment to the viability of change is assured. He believes the change will work and he is committed to making it happen. [Gluckstern and Packard; Margulies & Raia; Margulies and Wallace; Atkinson]

The independence that is the external change agent's strength is also the source of his weaknesses. The external change agent has the following disadvantages:

- Starts without established credibility. He is a stranger.

- Limited by his initial lack of practical experience in the organization.

- Lacks an understanding of the organization's norms and values.

- Has little understanding of the informal culture and who are the opinion leaders.

- Does not identify with the organization's problems.

- Must become acquainted with the organization's structure, culture, products, and processes. It takes time and effort to do this.

- Runs the risk of being shortsighted and developing a shallow interpretation of the problem if he tries to "get up to speed" too hastily. [Hunsaker, Gluckstern and Packard; Margulies and Wallace; Margulies and Raia; Atkinson]

To capitalize on the strengths of both the internal and external change agents and minimize their drawbacks, many organizations use both as a team. A "change team" utilizes each of the member's particular strengths so that they can achieve a level of change not possible when either is working alone. Combining the energies of two people allows

46

more attention to be paid to the change effort. The internal/external change agent team arrangement allows mutual support and encouragement, and lessens the frustration and loneliness inherent with a single change agent. [Gluckstern and Packard; Margulies and Wallace]

In addition to maximizing the advantages and minimizing the differences of each member, the team concept allows an evolution of the roles. The external change agent's role is meant to be temporary from the start. He is hired by the organization for the transition period. The external member is used to start the implementation and to train the internal change agent. The initial roles of the two change team members shift as the change effort progresses. [Gluckstern and Packard; Margulies and Wallace]

The initial role of the external change agent is to provide expertise and knowledge. He is aggressive in initiating change. The initial role of the internal change agent is to soak up knowledge on being a change agent, learning organizational development, teamwork, and working through people. Providing information to the external change agent on organizational structure, products, culture and politics is his primary task. True commitment to the change effort is gained as it progresses. He is initially "neutral." His role is to support the external change agent in his effort and to learn. He is not aggressive in pushing

the organization. [Gluckstern and Packard; Margulies and Wallace]

As the change effort progresses, the roles gradually shift. The internal change agent assumes the training effort and begins to act as the catalyst for change. He becomes the vocal spokesperson and motivating force behind the program. At the same time, the external change agent withdraws to a neutral support role, backing up the internal change agent. When the transition is complete, the external change agent leaves the organization and the internal change agent runs the change effort on his own. [Gluckstern and Packard; Margulies and Wallace]

H. POLITICS OF CHANGE

A final factor that must be considered in any change effort is politics. Politics is an exercise in power. Ignoring politics can cause an otherwise comprehensive change effort to falter or fail. [Lancourt]

Implementing changes is inescapably a political process. Changes in an organization invariably threaten the current distribution of power. Every organization has a political environment which is produced by power acquisition behaviors of its people. The politics of change requires the use of people's power acquisition behaviors to lend support to the implementation of the change effort.

There are two types of relevant political power: authority and influence. Although the change agent may have

authority due to his position in the organization, using
this power to order actions will not produce lasting change,
only temporary compliance. True change is best achieved by
influence power. Influence is the power to get the
organization's people to do something the change agent wants
them to do. The emphasis in the politics of change is not
on "what" he wants them to do, it is on "how" he uses
influence power to get them to do it. If the change agent's
influence causes people to become involved and committed,
the organization's people will own the change and it is more
likely to be a permanent change. [Lancourt]

The best way to influence people is to appeal to their
self-interest. The reason an individual gives as their
motive for an action is usually a secondary reason. True
motivation stems from the basic motivation of self-interest.
The change agent must appeal to self-interest to
successfully influence people and sell his change. No
matter how technically and logically well-grounded the
implementation plan is, it will not succeed if the change
agent ignores people's self-interests. While the appeal to
self-interest alone is not sufficient to make the change
effort successful, without such appeal, success is highly
unlikely. [Lancourt]

The basis for appealing to an individual's self-
interest is an understanding of an individual's underlying
values. Everyone has values. Values define what is

desirable and undesirable. Values form an important basis
for decision making. Examples of these values include the
individual's work ethic, desire for money, inner
satisfaction at doing a good job, and his feeling toward
craftsmanship. The change agent must realize that impetus
for change is generated by people's perception of the
difference between what currently exists and what is valued.
It is also important to realize that the "value framework"
varies from individual to individual. The change agent must
be politically sensitive to the different values of the many
people in the organization as he works with them.
[Lancourt]

A key to understanding the politics of any organization
is access to the organization's political network. The

Given the political nature of organizations, the change
agent should always expect resistance from those who seek to
maintain their own power or eliminate the power of the
change agent. The way to overcome political resistance is
not through the technical content and logic of your change.
The change agent must establish power bases and political
liaisons above and beyond technical competence. Power bases
are the resources that give an individual the ability to
convince others to support the change effort. Examples of
power bases include expertise, experience, access to top
management, the informal culture of the organization,
mobility, and tradition. [Schein]

A key to understanding the politics of any organization
is access to the organization's political network. The

political network is an informal network of relationships between the holders of power in any organization. The network can provide the pulse of the organization and give its true feelings on the change effort and reveal many of the sources of resistance. A person must be an "insider" to gain access to the network. [Schein]

The politics of change also impact the change agent's daily actions. Being political is the sense of knowing what is possible, when it is possible, and the best way to get there. The change agent must be sensitive to changes in the political climate in the organization. He must be able to send up "trial balloons" on his ideas to test the organization's reactions without committing himself to an untenable position. He must know which issues are important to take a stand on and which are not. He must have the finesse to apply the right amount of pressure without overstepping his bounds. He must have the judgement to know which part of an idea to advance first, when to hold his ground, and when to graciously concede a loss. He must be able to judge the current balance of power on any issue. To a large degree, this kind of political sensitivity is only developed by a long association with the organization and supports the notion of using both internal and external change agents in most cases. [Schein]

The politics of change forces the change agent to confront the realities of organizational life. The change

effort will never go smoothly and according to plan. It is
continually contaminated by the realities of the real world.
The change agent, no matter how technically competent, must
swim in the murky waters of politics. The politics of
change plays an unavoidable and very important part in the
change effort and should be used to the change agent's
advantage. [Schein]

V. SURVEY RESPONSE AND DATA

A. RESPONSE TO THE SURVEY

Response to the survey was better than anticipated. A bigger percentage of surveys were returned than expected and they were returned more quickly. The survey returns were received as follows:

	Civilian	Federal
Total mailed (23 March)	88 surveys	55 surveys
Received by week:		
1st Week (27-31 March)	None	None
2nd Week (3-7 April)	12	13
3rd Week (10-14 April)	7	6
4th Week (17-21 April)	7	10
5th Week (24-30 April)	4	2
6th Week (1-5 May)	3	4
7th Week (8-12 May)	3	1

By the end of the fifth week, the goal of receiving 30 completed civilian survey returns had been reached. This represented 34% of the civilian surveys originally sent. During the same period, 31 federal surveys had been returned. This was 56% of the federal surveys originally sent and confirmed the researcher's initial feeling that relatively fewer of the civilian companies would return the survey. After screening all of the returned surveys, two

federal surveys were rejected because they showed the
organizations were using traditional quality control and not
quality management. That left only 29 valid federal
surveys. The first federal survey received during the sixth
week completed the goal of 30 federal survey returns. All
surveys received after this point were read for information
and some of their comments were considered, but they were
not counted in the numerical analysis of the survey in this
chapter.

The response rate to the survey avoided the necessity of
sending out any follow-ups. This excellent response rate
was believed to be partly due to targeting by name of
specific companies and individuals known to be using TQM.
The use of personal cover letters and personalized return
envelopes made it easy for them to reply. Another probable
reason for the quick response is that TQM is a topic which
is generating a lot of current interest in people both in
government and in the civilian sector. The prospect of
receiving an executive summary of the thesis also prompted
many to complete the survey. When returning the survey,
many respondents included personal letters, copies of
articles they had written, organizational quality manuals,
and copies of old speeches and presentations. The survey
responses showed that people are enthusiastic about TQM and
hungry for new information.

One of the purposes of surveying both federal and civilian organizations was to look for differences in how they operated. One difference became apparent in the return process. Five of the civilian companies sent letters saying that they did not do surveys, but appreciated being included. No federal agencies responded saying they did not wish to participate. The difference shows the concern of civilian companies for protecting their public image.

B. COMPILATION OF SURVEY DATA

The remainder of this chapter will cover how the raw survey data were compiled and list the data. The analysis and conclusions, based on this data, will be presented in Chapter VI.

Survey returns were compiled into two master surveys, one for the 30 civilian organizations and the other for the 30 military organizations. Due to the nature of the questions asked, the surveys were all manually reviewed. The survey was not set up to be machine or computer graded. Many of the questions were subjective, asked for opinions, or left a blank for organizations to write in alternate answers. In compiling the data, reasonable license was taken in categorizing similar answers. For example, when considering the question about the traits of a TQM coordinator, the answers "creative" and "innovative" were considered to be the same.

The results of the survey questions were treated differently depending on whether they were quantifiable or subjective. For questions easily quantifiable, averages, modes, or medians were calculated, as appropriate. The figures are based on the total of 30 returns or the percentage of organizations that answered the question. Some of the survey respondents occasionally skipped a question, and some wrote little or nothing on questions requiring a written response. In these cases, the figures are based on those surveys that actually answered the question. Another consideration is that many of the survey questions allowed multiple answers so the percentages add to more than 100 per cent on these questions. For more subjective questions, summaries of the overall trends are given.

C. SURVEY DATA

This section summarizes the data obtained by the surveys. The data for civilian and federal organizations were summarized separately where the data were significantly different. Where there was no difference, the findings were combined. All direct quotations from the survey cite the name of the respondent and his company. In cases where no individual name was included on the returned survey, the company name alone is cited. Answers that the respondents listed under the "other" section are explained in the "comments" section if they were significant. "Other"

answers that were not explained mean either the answers had
no trend or pattern, were not significant, or people simply
did not give an explanation.

For ease of reading, survey answers are condensed from
what was on the original survey. The original survey had
amplifying information that explained or restated each
answer. The complete survey as the respondents saw it is in
Appendix A. The following is a summary of the data received
from the survey:

<center>Background Data</center>

1. Primary business: (multiple answer question)

	A. Results:	Civilian	Federal
	Manufacturing	60%	20%
	Service	17%	86%
	Sales	10%	7%
	Other	14%	23%

2. Number of Employees:

	A. Results:	Civilian	Federal
	1 to 500	10%	7%
	501 to 1000	None	7%
	1001 to 1500	3%	3%
	1501 to 2000	7%	7%
	2000 or more	80%	76%

<center>57</center>

3. Your employees are in which category:

    A. Results: Civilian firms, by definition, were 100%
civilian. It was interesting to note that the majority of
federal organizations in this study were run by military,
but the military personnel accounted for only 1 to 5% of the
organizations' people. The vast majority of the federal
organizations' people, some 95 to 99%, were government
service.

4. What is the name used to describe your quality effort?

A. Results:	Civilian	Federal
Total Quality Control	10%	None
Total Quality Management	13%	86%
Company-Wide Quality Control	None	None
Zero Defects	None	None
Quality Improvement Process	20%	7%
Quality Control	None	None
Program has no formal name	3%	None
Other:	54%	7%

    B. Comments: Some of the "other" civilian names used
were: Total Quality Improvement, Leadership Through
Quality, Quality in Action, and Total Quality Culture. Due
to the Department of Defense's adoption of TQM as its
official name, TQM dominated the federal category.

5. Do you have a "traditional" Quality Control Department which does procedures such as final product inspections/sampling, Acceptable Quality Level (AQL) Testing, etc.?

A. Results:

	Civilian	Federal
Yes	86%	62%
No	14%	38%

If yes, what size is the Quality Control Department now compared to before you went to quality management?

	Civilian	Federal
Smaller	77%	47%
Same size	18%	47%
Larger	5%	6%

6. How does your company define Quality Management?

A. Results: During the search of current literature, it was hard to find good definitions of quality management. However, the survey produced a lot of good definitions and many of them are worth considering. The following are some of the best:

(1) Civilian Answers:

- "Providing products and services which meet customer (both internal and external) needs and expectations over the life of the product, or service, at a cost that represents customer value." Phillip G. Hoffer, Ford Motor Company

- "Empowered people working together as a team, achieving customer satisfaction through total quality and continuous improvement of the process, in all that we do." Gary G. Gerber, McDonnell Aircraft Company

- "A scientific way of managing a business that emphasizes expansion of sales and growth of the company through achievement of customer satisfaction in its products and services." Dr. Noriaki Kano (definition provided and used by Florida Power and Light)

- "Application of quantitative methods and human resources to control all processes with the objective of achieving continuous improvement and customer satisfaction." Dr. Gail Dimitroff, General Dynamics Space Systems Division

- "Never ending company wide improvement process which involves everyone learning how to improve every aspect of our company so that we can provide quality products and services that fully satisfy our customers." Michael J. Cordry, Weyerhaeuser Paper Company

- "Providing our external and internal customers with innovative products and services that fully satisfy their requirements." Norman E. Rickard, Xerox

- "Quality in all we are and in all we do." George E. Heard, Coors Brewing Company

(2) <u>Federal Answers:</u>

- "Continuous process improvement through the reduction in process variation in an environment of participative management and employee involvement." LCDR Gary Burchill, Naval Supply Center, San Diego

- "A leadership philosophy that creates a working environment which promotes teamwork, trust, and the quest for continuous improvement." COL Roger S. Alexander, Aeronautical Systems Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio

- "Providing the customer with what he wants and needs, every time, at the lowest cost." Jerry D. Stark, Headquarters, U.S. Marine Corps

7. Does your company emphasize the quality theory or teachings of any particular individual(s) in its quality management effort?

A.   Results: Civilian   Federal

    No particular individual   37%   17%

    Combination   26%   30%

    W. Edwards Deming   43%   73%

    Joesph M. Juran   37%   20%

    Phillip B. Crosby   30%   20%

    Kaoru Ishikawa   10%   7%

    Arnold V. Feigenbaum   7%   7%

    Genichi Taguichi   7%   3%

    Others   9%   16%

B.   Comments: Civilian "others" included William
Conway, Masaaki Imai (Kaizen), and Japanese Union of
Scientists and Engineers (JUSE). Federal others included
Tom Peters, Peter Drucker, and Masaaki Imai.

8.   How long has your organization pursued quality
management?

A.   Results   Civilian   Federal
    Average length (in years)   6.26   2.63

Motivation to Pursue Quality Management

9.   Why did your organization pursue Quality Management?

  A.   Results: Civilian   Federal

    (1)   To remain competitive,
        competitive pressure   73%   53%

		Civilian	Federal
(2)	To improve productivity and reduce costs	73%	83%
(3)	Enlightened management pursuing an improved organization	70%	63%
(4)	A crisis in the organization	17%	20%
(5)	To handle budget cuts and remain in business	3%	43%
(6)	Other	30%	17%

B. Comments: Two good quotes: "Time to fix the roof is when the sun is shining." Gary G. Gerber, McDonnell Aircraft Company. "Our people wanted to use their brains as well as their hands." David Luther, Corning Glass. In 14% of the federal organizations the answer was because it was mandated by headquarters. This is an impact of official direction to adopt TQM by DOD, Office of Management and Budget, and other high level government agencies.

10. Who was the initiator or "champion" of quality in your organization?

A. Results:	Civilian	Federal
Top Management	75%	83%
Middle Manager	25%	17%
Supervisor	None	None
Worker	None	None

11. Was Quality Management implemented at your company by:

A. Results:	Civilian	Federal
External quality consultant	40%	12%
Internal quality consultant	3%	33%
Team approach	44%	50%
Other approach	13%	None

12. Were your internal/external/or team consultants assisted by a quality management staff?

A. Results:	Civilian	Federal
Yes	85%	81%
No	15%	19%

13. How many fulltime employees are in your quality management staff? How many part time?

A. Results: The number of employees varied widely, but it was always small. This will be discussed in Chapter VI.

14. To what degree has your organizational structure changed as a result of your quality management effort?

A. Results:	Civilian	Federal
No change in structure	25%	43%
Minor changes to structure	28%	39%
Major overhaul of the structure	47%	18%

B.   Comments: In federal organizations, two notes were
frequently added: (1) The TQM infrastructure overlays the
formal organization, and (2) many organizations have major
changes in mind for the future, but their implementation
into TQM was too recent to make the changes yet.

15.   What is the main emphasis of your organization's
quality management effort?

A. Results:	Civilian	Federal
Product-oriented	6%	3%
Process-oriented	79%	97%
Quality-of-work-life	9%	20%
Other	6%	3%

B.   Comments: Federal organization "other" comments
indicated that TQM was combined with other programs such as
Productivity Capital Investment, Productivity Gain Sharing,
and the remnants of other performance improvement efforts.

16.   Was a formal implementation (change) plan written and
used?

A. Results:	Civilian	Federal
Yes	89%	81%
No	11%	19%

B. Comments: Most added a comment that the original plan was changed numerous times during the implementation. Many noted that the TQM plan was incorporated into their annual strategic or business plan.

Training

17. Which of your employees has received (or will receive) some type of quality training, regardless of the degree of training?

A. Results: The following answer was given by 100% of the organizations: Everyone, top management to the lowest level, should be trained.

18. How are they trained?

A. Results:		Civilian	Federal
(1)	Sent to schools or courses outside of the organization	43%	70%
(2)	Within the organization by a hired external consultant	47%	70%
(3)	Within the organization by an internal consultant	80%	90%
(4)	Self-study with books, videos, and work group meetings	40%	50%
(5)	Other	13%	7%

B.   Comment: One interesting idea was to use a "brown bag university" at lunch to teach quality management.

19.   How does your organization's regular training department fit into your implementation plans?

A. Results:		Civilian	Federal
(1)	As a team with Quality Management Staff	57%	50%
(2)	Will provide continuity and training after the implementation period	17%	30%
(3)	Provides only specific training	10%	None
(4)	Training department not used	10%	17%
(5)	Do not have a training department	7%	3%
(6)	Other	None	None

B.   Comment: One good quote: "Total quality begins with training, ends with training-it is a way of life." George M. Graham, Texas Instruments.

Implementation Problems

20.   Do you try to anticipate "resistance to change" and plan/prepare to overcome or reduce it?

A. Results:	Civilian	Federal
Yes	89%	89%
No	11%	11%

If yes, does your plan address:

Technological Change:

	Civilian	Federal
Yes	100%	83%
No	None	17%

Social Change:

	Civilian	Federal
Yes	100%	93%
No	None	7%

21. Which of the following techniques do you use to
overcome resistance and "sell" the need for change? For
each one that you used, rate the effectiveness on a scale of
1 to 5.

 1 = not effective   2 = somewhat effective   3 = effective

 4 = very effective   5 = extremely effective

A. Results: (In order of average effectiveness)

   (1) Civilian Answers: Average Answer:

a. Involve work force participation in
    planning changes to give them
    "ownership" in the changes   4.19

b. Appeal to individual or departmental
    self-interest (show them "what's in
    it for me.")   3.86

c. Strong two-way communications--good
    feedback   3.83

d. Give credit to the people who make
    the improvements   3.83

e. Address and reduce "fears" that
    people have about the changes up front 3.76

f. Thorough employee training up front   3.68

g. Use a pilot project and publicize
    its success   3.52

h. Utilizing influential people in
    informal organization   3.39

i. Seek <u>no</u> recognition for yourself
    (as quality implementor) or for your
    quality staff. Be humble.   3.16

j. Quick action on worker suggestions to
    improve your product or quality of
    work life   3.15

k. Use an outside expert to inspire
    employee confidence   2.74

l. Tell workers to remain skeptical and
    watchful until management <u>actions</u>
    match their <u>statements</u> on quality   1.89

    (2)   <u>Federal Answers:</u>

a. Give credit to the people who make
    the improvements   4.20

b. Strong two-way communications-good
    feedback   4.11

c. Involve work force participation
    in planning changes to give them
    "ownership" in the changes   4.08

d. Quick action on worker suggestions
    to improve your product or quality
    of work life   3.65

e. Use influential people in the
    informal organization   3.44

f. Use a pilot project and publicize
    its success   3.41

g. Address and reduce "fears" that
    people have about the changes up front   3.28

h. Appeal to individual or departmental
    <u>self-interest</u> (show them "what's in
    it for me")   3.26

i.   Seek <u>no</u> recognition for yourself
     (as quality implementor) or for your
     quality staff. Be humble.   3.13

j.   Thorough employee training up front   3.12

k.   Use an outside expert to inspire
     employee confidence   2.75

l.   Tell workers to remain skeptical and
     watchful until management <u>actions</u> match
     their <u>statements</u> on quality   2.07

     B.   Comments: One good quote: "Empower the workforce--
make them responsible and accountable." Gary G. Gerber,
McDonnell Aircraft Company.

22. What provided the most resistance to your quality
management efforts?

     A.   Results: (similar answers grouped and listed in
order of frequency)

          (1) <u>Civilian Answers</u>:

          a.   Getting visible management action (no level
specified), too busy with other things, failure to "walk
what you talk." One motto summed this pretty well: "Say
what you mean, mean what you say, deliver what you promise."
Gary G. Gerber, McDonnell Aircraft Company.

          b.   Lack of top management support, too little top
management "modeling," not enough enthusiasm, too busy,
convincing people that top management was sincere.

          c.   Middle management support, fear of losing
authority.

(2) <u>Federal Answers:</u>

a. Middle management/first line supervisors. They resisted due to a feeling of loss of power and information control. They also saw TQM as a threat and perceived that they were the ones with the most to lose.

b. TQM viewed as "just another program." Skepticism was wide spread among workers. Many thought it was just another management notion or "buzzword." Frequent changes in top management, both military and government service, have made the workers cynical about new programs. One respondent commented that people were hesitant to give full commitment to TQM because they feared that TQM would crumble when the present commanding officer left.

c. Top management. They had a hard time making their actions match their words. Lack of top management's continued support. Their desire to pursue only short term goals.

d. "Full plate resistance." Everyone already has a full schedule and workload. Many cited overwork and too much to do already to allow time to learn TQM.

Measuring Success

23. A customer is anyone who receives the benefits of your work. A Customer can be external or internal to your organization. How do you get "Customer Feedback" on your quality improvement? (multiple answer question)

A. Results: Civilian   Federal

    Market surveys   70%   30%

    Level of complaints   76%   67%

    Internal customer reports   73%   50%

Meetings with workers/supervisors   70%   57%

    Other   20%   20%

B. Comments: Civilian "others" included: Reduction in warranty costs, field trips to customers, field reports by company representatives, and customer focus or group meetings. Federal organizations frequently cited customer service meetings.

24. How do you figure the Cost of Quality?

A. Results: Civilian   Federal

    Amount of scrap and rework   50%   23%

    Number of failures   33%   23%

    Complaints from customers   30%   17%

    We don't measure it   20%   63%

    Other   47%   3%

B. Comments:

(1) Civilian Answers

Civilian firms added a lot of comments on this question. Their "others" included: Cost of prevention + cost of appraisal + cost of repair; value added to the product; price of nonconformance + price of conformance in time and dollars; and cost of conformance + cost of

nonconformance + opportunity costs. General Dynamics Land
Systems Division uses an extensive formula to calculate the
"Cost of Unquality" which considers engineering time,
production, materials, and other elements.

    (2) Federal Answers

       In stark contrast, Federal organizations made
<u>absolutely</u> no comments on this subject.

25. How does your organization measure the success (or
progress) of your quality program?

A. Results:	Civilian	Federal
Primarily quantitatively	8%	7%
Primarily qualitatively	23%	52%
Both ways	69%	41%

    For organizations using both, the average split
was:

		Civilian	Federal
(1)	Quantitative average	57%	33%
(2)	Qualititative average	43%	67%

26. Has an independent evaluator (from outside of your
organization) ever been used to judge the success (or
progress) of your implementation?

A. Results	Civilian	Federal
Yes	63%	57%
No	37%	43%

27. Is your Quality Management Implementor (and/or staff) a
permanent part of your organization, or will your
organization reach a point when Quality Management is
"institutionalized or internalized" and the implementor
(and/or staff) are no longer required?

		Civilian	Federal
A.	Results:		
	Permanent	64%	47%
	Temporary	27%	43%
	Do not know yet	9%	10%

Quality Management Implementor Data

28. How long have you been in your current position as the
Quality Implementor/Facilitator/Coordinator?

	Civilian	Federal
A. Results: (in years)	3.67	2.42

29. What is the title of your position?

A. Results:

(1) **Civilian Answers:** Wide variety of names. Some
of the most common were: Director of Quality, Director of
Quality and Productivity, and Vice President or Senior Vice
President of Quality.

(2) **Federal Answers:** Another wide variety of
names, many of them similar to civilian counterparts.
Unique federal names included: TQM Advocate, and Director of
TQM Resources Office.

30. Are you:

A. Results:	Civilian	Federal
Military	None	17%
Government Service	None	70%
Civilian	100%	13%

B. Comments: The 13% civilians listed under federal are probably the result of survey respondents choosing the wrong category and should be added to the 70% Government Service.

31. Was your previous job from a "line" organization (which produces your principal product or service) or a "staff" organization (which supports the line organization)?

A. Results:	Civilian	Federal
Line	56%	37%
Staff	44%	63%

32. What level are you in the organization?

A. Results:	Civilian	Federal
Top Management	32%	31%
Middle Manager	61%	62%
Supervisor	7%	None
Worker	None	7%

33. What kind of <u>access</u> do you have to the CEO/President/
General Manager (for civilian companies) or to the
Commanding Officer (for military)?

    A. Results:

	Civilian	Federal
Direct access	63%	82%
Access via one level	33%	11%
Access via two levels	None	4%
Access through three(+) levels	4%	3%

34. What level of access would you recommend to another
quality manager and why?

    A. Results:

	Civilian	Federal
Direct Access	84%	89%
Access via one level	16%	11%

    B. Comments on "why": People were very vocal on this
question.

        (1) <u>Civilian Answers:</u>

- "Depends on the size of the organization--direct or one
level removed." Laszlo S. Papay, IBM

- "Direct, avoids translation confusion up and down."
Phillip M. Scanlan, AT&T

- "Quick Access (to top management)" Jack Germain,
Motorola

- "(Direct access) For need and appearance." Eric E.
Smith, General Dynamics Land Systems Division

- "The first strategy for quality is providing visibility
and unquestioned leadership." David B. Luther, Corning
Glass

- "Personal leadership of senior management critical to success." Norman E. Rickard, Xerox

- "Provides an important message to <u>all</u> employees, as well as adding real power to quality programs in <u>all</u> organizations." Phillip G. Hoffer, Ford Motor Company

- "Failure to maintain autonomy results in a conflict of interest. Quality must stand alone with no alliance to any other division." Bruce A. Thompson, Votan

　　　(2)　<u>Federal Answers:</u>

- "You can not afford any filters." Pat Jordan, Fleet Accounting and Disbursing Center Pacific

- "Don't need a filter, or a consultation relationship builds up." COL Roger S. Alexander, Aeronautical Systems Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio

- "Need to be the <u>command conscience</u> to provide direct feedback to the commanding officer." Donna Tierney/ Deanna Bernet, Naval Supply Center, San Diego

- "Commanding Officer is responsible for the implementation." COL Jerald B. Gartman, Naval Aviation Depot, Cherry Point

- "Top level is responsible for getting the implementation working in the organization. Conspicuous top management support is essential." David H. Carstater, Deputy Specification Control Advocate of the Navy

- "Quality is not one of the functions, it is the drive of all functions." John Lobeck, Naval Weapons Support Center, Crane, Indiana

35. When picking someone to be a Quality Implementor or

Facilitator, what personality traits, characteristics, and

qualities are important? Please rate the following scale:

　　　Not important　　　　　　　　　　　1

　　　Below average importance　　　　　2

　　　Average importance　　　　　　　　3

Above average importance   4

Critically important   5

A.   Results: (In order of average importance)

(1) <u>Civilian:</u>   <u>Average Answer:</u>

Interpersonal Skills	4.69
Established credibility/competence in your organization	4.62
Listening skills	4.62
Motivation/Initiative	4.62
Self-confidence/Self-assuredness	4.62
Participative management style	4.48
Speaking skills	4.27
Imagination/Innovative ability	4.27
Theoretical understanding of Quality Management	4.24
Political Savvy	4.03
Intelligence	4.03
Writing skills	3.90
Knowledge of your companies business	3.89
Dynamic personality	3.89
Knowledge-behavioral science/ organizational development	3.86
Formal position power in the organization	3.79
Knowledge of statistics	3.17

(2) <u>Federal:</u>

Speaking skills	4.80
Listening skills	4.80

77

Interpersonal Skills	4.70
Motivation/Initiative	4.70
Established credibility/competence in your organization	4.53
Theoretical understanding of Quality Management	4.53
Self-confidence/Self-assuredness	4.50
Imagination/Innovative ability	4.47
Participative management style	4.33
Intelligence	4.27
Writing skills	4.20
Political Savvy	4.20
Knowledge-behavioral science/ organizational development	4.13
Dynamic personality	4.06
Knowledge of your companies business	4.03
Formal position power in the organization	3.63
Knowledge of Statistics	3.53

36. If you were picking a Quality Implementor for another organization similar to your own, <u>what four traits or characteristics would be most important to you.</u> These may or may not be from the previous question.

    A. Results:

        (1) <u>Civilian:</u> (similar answers grouped and listed in order of frequency)

a. Integrity, perseverance, commitment, dedication, courage of one's convictions, unswerving, tenacity.

b. Speaking ability, articulate.

c. Interpersonal skills.

d. Confidence, credibility inside the organization, competence, confidence of the CEO/top management.

e. Knowledge of the business/product.

f. Theoretical knowledge of quality, quality concepts, quality management theory/principles.

g. Motivation, aggressiveness, drive, enthusiasm.

(2) Federal:

a. Knowledge of quality management theory.

b. Knowledge of the business, organizational competence, knowledge of the operations.

c. Motivation and initiative.

d. Effective interpersonal skills.

e. Innovative, imaginative, creative, conceptual ability, and independent mind.

f. Speaking skills, articulate, influential.

37. How have you achieved <u>technical competence</u> in Quality
Management?

A. Results:	Civilian	Federal
Self-study	70%	100%
Formal course or school	57%	83%
Training by another Quality Manager	23%	37%
On-the-job training (OJT)	70%	43%
Other	17%	13%

38. How have you established <u>credibility</u> in your
organization?

A. Results:	Civilian	Federal
Formal position power	33%	43%
You were an external expert	17%	10%
Access to top management	37%	63%
Previous internal reputation	60%	80%
Other	20%	7%

39. How do you manage "horizontal communications" (to
peers in the organization) without appearing threatening or
manipulative?

A. Results: (similar answers grouped and listed in
order of frequency)

    (1) <u>Civilian Answers:</u>

        a. Cross-functional teams, team building,
quality council, management council, consensus at

participative meetings, cooperative effort, involve them, create an open environment, create ownership.

       b.   Provide assistance, help them, act as a trainer, be a consultant, getting in and helping whoever needs it. "Treat them as customers." William Scherkenbach, General Motors.

      (2)   <u>Federal Answers:</u>

       a.   Use of teams, consensus decision making. "We're all in the boat together." Gene Hepler, Naval Aviation Depot, North Island, California.

       b.   Open, honest communications, always be candid, tell all, do not withhold or manipulate information.

       c.   Offer assistance, send a lot of information, be helpful, find out their needs and tailor to help them.

       d.   Do not direct, never say "you have to," by not using the power of command. "Maintain an advisory role, not directive role." Donna Tierney/Deanna Bernet, Naval Supply Center, San Diego. "Emphasize they are the leader-- you the advisor." COL Roger S. Alexander, Aeronautical Systems Division, Air Force Systems Command, Wright- Patterson Air Force Base, Ohio. "I'm not in charge of TQM, the (commanding officer) is and it's his program.... My peers are working for their boss." James J. Albanese, Naval Sea Systems Command. "I never say you have to, you must, or

preach about TQM. I leave that to the commanding officer."
Gerald R. Fleury, Naval Sea Support Center.

        e. Use top management. "Educate top
management and let them influence their middle managers to
act appropriately". LCDR Gary Burchill, Naval Supply
Center, San Diego.

    B. Comments: A wide variety of other answers
including: be tactful, be consistent, stress common company
goals, be responsive to calls and visits, visit them often,
and management by walking around ("MBWA"--Tom Peter's idea).
Good Quote: "What you are speaks so loudly I cannot hear a
word you say." Tom Barry, Tom Barry Associates.

40. How did you achieve and keep the "Big Picture" of your
organization?

A. Results:	Civilian	Federal
Liaison with top management	70%	67%
You are part of top management	50%	43%
Access to strategic planning process	60%	57%
The "Big Picture" is not important	None	3%
Other	13%	13%

41. Do you think it is necessary to seek support from
influential people in the _informal_ _culture_ of your
organization to help "sell" and implement your program?

	Civilian	Federal
A. Results:	Civilian	Federal
Yes	100%	100%
No	None	None

42. Significant additional comments added to the survey:

A. Results: Comments in this section generally summarized the points that the respondents had already made on previous questions.

VI. ANALYSIS AND CONCLUSIONS

A. APPLICABILITY AND EMPHASIS OF THE RESEARCH

This chapter will answer the eight research questions on the role of the TQM coordinator originally posed in Chapter I. The conclusions reached are based on quality management knowledge gleaned from interviews, current literature, and the survey. The goal is to produce a well-rounded look at the subject and some new insights that will be helpful to TQM coordinators and their organizations.

The applicability of the conclusions drawn in this thesis research vary. Some conclusions seem to be fundamental and apply to all organizations, regardless of whether they are civilian or government. Other conclusions differ based on the size, type, and composition of the organization. Just as there is no one way for all managers to manage, there is no "cookbook" approach to quality management. Every organization is unique in some way, and some aspects of the TQM coordinator's role must be tailored to fit the needs of the organization.

The emphasis of this thesis is what is happening in business and government today. Research concentrated on actual TQM coordinator's experiences to draw conclusions. The intent is to provide practical, useful information. This will allow a new coordinator to avoid "reinventing the

wheel" by profiting from the lessons learned by those going before him. In some instances, real world practices differed from theoretical ideas. In these cases, experience gained by coordinators was given more weight than the theories. As President Theodore Roosevelt once said, "Credit belongs to the man in the arena. The man with sweat on his brow and dirt on his hands. The man who has labored greatly, known great success and endured great failure."

B.   GENERAL CONCLUSIONS ON THE ORGANIZATIONS STUDIED

Before answering the research questions, a few general comments need to be made on the organizations studied to provide a frame of reference. The following general background information should be considered.

1.   Size and Type of Organization

The conclusions of this thesis are based primarily on the experiences of large organizations. Fifty percent of the organizations studied had 2000 people or more. The research was evenly split between civilian and federal organizations. Civilian organizations involved in the study cited manufacturing as their primary business while government organizations cited service.

2.   Quality Management Theory Used

The quality management theories that these organizations used generally stressed using people and quantitative methods to continuously improve on processes and products. No particular quality management theory was

prevalent. Most organizations pursued what is best
described as an "eclectic approach" to quality theory. They
incorporated the best in the various theories into their own
organizational philosophy.

3. Experience with Quality Management

The length of time that organizations have been
involved in TQM was relatively short and had an impact on
some of their answers. Civilian organizations averaged 6.26
years experience with TQM, while federal organizations
averaged 2.63 years. In several federal interviews, the
idea surfaced that "industry is following DOD." Research
did not bear this out. The newness of TQM efforts was also
reflected in how long the TQM coordinator's had been doing
their jobs. Civilian coordinators averaged 3.67 years on
the job and federal coordinators averaged 2.42 years. The
length of time the organizations and their coordinators had
pursued TQM did affect their answers. Some answers showed
trends directly related to the maturity of the TQM effort.

4. Why Organizations Pursued Quality Management

The motives behind pursuing TQM followed several
predominant themes. Civilian organizations consistently
cited competitive pressure and the need to increase
productivity and reduce costs. Federal organizations were
concerned with maximizing their productivity on a limited
budget. An interesting observation on motives was that an

unexpectedly high percentage of organizations cited "enlightened" management as a motive, while relatively few cited "a crisis in the organization." I believe the desire to present a good appearance biased the results on these responses. TQM was probably adopted less due to "enlightened management" and more due to crisis situations than the survey indicates. Organizations today are generally under considerable pressure, both internal and external, to improve. Top management has been aroused to action and is searching for solutions. As the English philosopher Ben Johnson once said, "There is nothing like the prospect of being hung in the morning to heighten a man's senses."

5.   Emphasis of the Quality Management Effort

The main emphasis behind organizations quality management efforts was consistently "process-oriented." Organizations were striving to use all their people to achieve a continuous improvement in all of the organization's products and processes. Organizations did indicate that they targeted the high payoff processes first. TQM theories all stress that results are derived in the long run. In reality, organizations scrambled to show genuine improvements in the short run by attacking processes with high payoffs, while simultaneously pursuing more long term cultural changes.

C. ANSWERS TO THE RESEARCH QUESTIONS

The remainder of this chapter will answer the eight specific thesis questions based on the organizations studied.

1. <u>What are the Traits, Characteristics, and Qualities Important in a TQM Coordinator</u>?

The first step in choosing a TQM coordinator is to develop a list of criteria that are essential for doing the job. This question was discussed at length during all the interviews. Question 35 on the survey listed 17 traits frequently found in current literature and had respondents rate them for importance. Because the list sounds a lot like "motherhood and apple pie" for the ideal leader, it was followed up by Question 36 which asked for the four most important traits. Combining the results of these questions, the most important traits that emerged are discussed next.

a. Integrity and Perseverance

This was the most frequently cited factor. The individual chosen must have courage to stick with his convictions. He must be known to be tenacious and unswerving in his drive toward his goals. He must have the strength of character to risk his career for ideas that he believes in.

If this sounds too strong, it isn't. During the interview at General Dynamics, the idea of integrity was emphasized particularly strongly as the key trait. [Dimitroff] The simple concepts of TQM lead to a powerful

change in the culture of the organization. The TQM
coordinator must have the integrity to stand up for the
principles of TQM when he runs afoul of cultural beliefs and
management practices developed over a lifetime. The person
initially selected may not believe this strongly in TQM, but
he must have the integrity to stand up for what he does
believe in.

b.   Credible Knowledge of the Organization's
     Processes and Products

Central to the theory of quality management is
the knowledge of process and product necessary to achieve
continuous improvement. However, the TQM coordinator needs
more than just knowledge. He needs the credibility that
people of all organizations place in someone who knows the
processes required to produce the product or service. The
interview with the TQM coordinator at FAADCPAC stressed this
point. [Jordan] The majority of civilian TQM coordinators
came from a line position. "Line" meaning the part of the
organization producing the principal product or service. In
sharp contrast to this approach, most federal TQM
coordinators came from staff positions.

When choosing a coordinator from either the line
or the staff, there are several factors to consider. One
factor is coordinators from the line already understand the
processes and enjoy the advantage of already having
organizational credibility. Coordinators who came from
staff positions tend to be non-product-oriented. It may

89

take more time for them to become knowledgeable on the processes and products. Another factor is a staff person frequently has to overcome the prejudice that staff people are impractical. Many line people have seen enough unrealistic staff proposals to conclude that staff people do not understand the swift-moving, harsh realities of daily business. Staff people are viewed as technique-oriented, not results-oriented. A new TQM coordinator with a staff background will have to overcome this prejudice. Although either staff or line coordinators can be used successfully, the key is selecting someone who already has the credibility and confidence of the organization.

     c.   Effective Interpersonal Skills

     Effective interpersonal skills are the foundation of the TQM coordinator's success. He must possess tact and sensitivity. He must be able to relate to people with a wide variety of backgrounds at all levels of the organization. Fundamental to this ability is a belief in people. The person selected as the TQM coordinator must truly believe that the organization's people are the source of ideas for continuous improvement. The TQM coordinator who possesses all the ingredients of effective interpersonal skills, except for a belief in people, is missing a vital ingredient.

d.   Well Developed Communication Skills

The ability to handle all types of communications is essential. Of the three communications skills, speaking, listening, and writing, speaking is the most important. The TQM coordinator should be an articulate and influential speaker. He must be able to conceptualize a compelling vision of the future organization in his head and then communicate it to all levels of the organization. He must sell the need for change and create quality awareness in the organization. The interview at Hewlett-Packard emphasized the ability to speak is also a vital part of the TQM coordinator's role as a trainer. He must have good presentation skills. [Doxey]

Surprisingly, the study showed that listening is a more important skill than writing. Two-way communications are critical in a TQM organization. The key to good two-way communications is the ability to listen. The TQM coordinator must be a sponge for good ideas. He must be able to really hear and understand what people say. He must be receptive and responsive to people's initiatives. When he is attending a TQM team meeting at any level, he must use his listening skills to help him apply the socratic method of guiding a discussion toward a desired ending.

The ability to write is important, but not to produce memorandums and directives. The formal paperwork directing the quality program should come from the CEO/CO.

Reports on the progress of TQM effort should come for the formal organizational chain of command and/or the TQM infrastructure. The TQM coordinator, in his role as a catalyst in making the TQM transition occur, needs the ability to write so he can provide assistance and training materials.

e. Motivation and Initiative

Motivation and initiative were consistently mentioned as traits required in the TQM Coordinator. However, federal organizations tended to place more emphasis on the aggression side of these traits than did civilian organizations. The rational behind this seems to be based on the relatively frequent rotations of military and government service employees. These rotations cause federal organizations to place a higher value on motivation and initiative to aggressively pursue changes. During the interview at NADEP, North Island, aggression was cited numerous times in the discussion. [Hepler] However, whether he be civilian or military, the TQM coordinator must have the motivation to continually push the program to be successful. The interview with the TQM coordinator at FAADCPAC best summarized the need for motivation and initiative when he said, "No one will tell the coordinator what to do next; no one else knows!" [Jordan] The coordinator must take the initiative in every aspect of TQM. He must analyze the organization for opportunities and

pursue them. He must exude enthusiasm and drive. Several organizations tied the need for motivation and initiative to the need for a dynamic individual with a high energy level. Although this is probably not a bad characteristic for a TQM coordinator to possess, it is not a decisive issue.

   f. Innovative Ability and Imagination

    Because TQM represents such a paradigm shift in management philosophy, the TQM coordinator will wrestle with many questions that have no precedent in his or the organization's experience. Solving these problems demands an individual with a broad imagination. He must have creative, conceptual thought processes that allow him to find innovative solutions to resolve questions and make TQM work.

   g. Knowledge of Quality Management Theory

    Your TQM coordinator must achieve competency in quality management theory, principles, and practices, but it is not a requirement that he be competent initially. If the individual chosen to be the coordinator already has both the theoretical knowledge of and a belief in quality management, the time required to start the implementation will be shorter. However, most organizations do not have such a quality management expert and will have to grow their own. Certainly an individual possessing the other traits mentioned can learn quality theory. Technical competence in quality management can be achieved by a combination of

formal courses, study and on-the-job training. Belief in quality management will take longer and must develop from application of the theory to produce actual benefits.

    h.   Less Important Traits

        The preceding seven traits are not all inclusive, but they appear to be the most important. Refer to Chapter V, Questions 35 and 36, for others mentioned.

        When making a decision it is also wise to consider what is not very important. In both the civilian and federal surveys, formal position power and knowledge of statistics ranked lcw in importance. Formal power, power due to position in the organization, was low because the TQM coordinator must act as a catalyst and use influential power to facilitate change. He does not use position power to direct change and is not in the formal chain of command. When selecting a cocrdinator, knowledge of statistics was not crucial because most organizations realized the importance of people-related skills over quantitative skills. The knowledge of statistics required to perform statistical process control (SPC) is necessary for the TQM coordinator. However, the basic technique of SPC is relatively easy to learn and previous knowledge of SPC is not critical when initially selecting a TQM coordinator (see Appendix C for more comments on SPC).

2. How is the TQM Coordinator Selected?

Actually selecting the TQM coordinator is done using the traits just identified. A logical framework is to consider the traits split into three groups.

a. Inherent Traits

Some traits necessary in a coordinator are inherently a part of an adult's character. They were born with these traits, the traits were ingrained in them by their parents, or they were a combination of both heredity and environment. These traits include integrity, perseverance, motivation, initiative, innovative ability, and imagination. Adults have a certain amount of each trait, and the traits can not be significantly altered. Integrity and perseverance are the most important traits. Imagination and innovative ability vary, but the more he has the better. Motivation and initiative are critical to implementing the paradigm shift of TQM. These inherent traits are the first logic screen to apply to the candidates in the selection process.

b. Traits Learned from Previous Experience

Some traits have been acquired by an individual through education and experience. These traits include well developed communications skills, effective interpersonal skills, and previous reputation. His communication and interpersonal skills should be highly developed. He should have a reputation that inspires confidence and credibility.

This is the second logical screen to apply when screening
individuals.

     c.   Traits that can be Taught

       Some traits may be completely absent in the
individual when first chosen to be the TQM coordinator.
They may be learned after getting the job. These traits
include credible knowledge of the product and processes,
quality management theory and quantitative tools. Credible
knowledge of the organization's products and processes is
central to quality theory. If the coordinator is chosen
from outside the organization, or was in a non-production
staff billet, extra time must be allowed for him to acquire
this organizational-specific knowledge. Quality management
theory and use of the quantitative tools of TQM, such as
statistical process control, can be learned. These traits
that can be taught are the third logic screen. However,
this screen is only effective if an organization already has
individuals who have these traits.

       These three types of traits can be used to
screen your candidates for TQM coordinator. The conclusion
is any actual selection of an individual to be a TQM
coordinator will involve tradeoffs and value judgments of
desired traits. Top management must balance all the factors
to select the best available individual.

3. <u>How does the TQM Coordinator Fit into the
    Organizational Structure?</u>

When considering organizational structure, the
primary concerns were where is the TQM coordinator placed,
what type of access is he given, and should the
organization's structure change? The answers depended on
the specific organization studied. However, there were some
common treads in their answers.

The TQM coordinator must be an independent agent if
he is to act as a catalyst and help the organization change.
He should not be assigned to any particular division or
department. Assigning him to a particular subdivision leads
people to suspect that he has a "hidden agenda" supporting
that division. [Burchill] During the interview at Fleet
Accounting and Disbursing Center, Pacific, the point was
made that the TQM coordinator should avoid any actions that
appear to be self-serving or benefit the coordinator
himself. [Jordan] Where practical, he should have no other
assigned responsibili- ties. He is best thought of as a
free agent with access both vertically and horizontally to
all levels of the organization.

Access to top management is also crucial to success.
All quality management theories specify direct access to top
management. Top management is normally the CO or CEO. The
results of survey Questions 33 and 34 agreed with this
theory for all federal organizations, and for civilian

97

organizations with less than 2000 people. For large, multi-
division civilian organizations, the theory still applies,
but top management must be redefined. For example, in a
large corporation such as Hewlett-Packard, there are 48
highly autonomous divisions that operate as virtually
independent businesses. When a division is implementing
TQM, the top management, for operational purposes, is the
local division manager. Giving the divisional TQM
coordinator access to the CEO of Hewlett-Packard would not
be an appropriate strategy. This is not to say that the CEO
of Hewlett-Packard is not concerned with TQM or does not
support TQM. The CEO simply is too busy for the TQM
coordinators from 48 divisions to all have direct access to
him. Access to top management must be redefined to mean
access to the highest echelon of the local organization.
This is the echelon that has the daily operational control
over the organization and the ability to make any necessary
decisions regarding quality issues.

Direct access is required for both appearance and
need. The mere act of allowing direct access presents the
right appearance and sends a powerful message to the
organization on the importance of quality. Few people have
the privilege of direct access to top management. The need
for direct access to top management allows the TQM
coordinator to provide feedback and act as the command
conscience. [Burchill] The paradigm shift of TQM makes it

hard for top management to always "walk what they talk."
When top management's actions do not match their stated
philosophy, the TQM coordinator must have direct access to
talk to them without intervening management layers adding
translation errors or acting as filters.

The final part to this question is whether the basic
organizational structure should change to accommodate
quality management. Federal and civilian approaches
differed on this question. The majority of federal firms
made no change in their organizational structure. Instead,
they developed a separate infrastructure of quality
management teams that overlaid the existing formal
structure. Several of them said the purpose of this
infrastructure is to serve as a bridge to help reach a new
organizational structure. It served this purpose because it
promotes the acceptance of the TQM philosophy and allows
people to practice new behaviors. The majority of civilian
firms, on the other hand, made a major overhaul of their
structure as a result of their quality management effort.
This was particularly true in very large corporations. The
change was to organize by process rather than by function.
Organizing around the process improves internal
communications and cooperation in reaching common goals.

The length of time the organization had been
involved with quality management also affected their
answers. The longer the organizational experience with TQM,

the more likely the organization will move to a flatter, less hierarchical structure. This is a result of workers assuming functions traditionally considered a part of middle management's job. As the layers of management decrease, the organization flattens. Many federal organizations did indicate that they had major changes in mind for the future.

For organizations just starting TQM, the best course of action is to not reorganize since their existing structure is the backbone of their current operations and is tailored to their type of business. The TQM coordinator should be added to the organization's structure.

The conclusion is that the TQM coordinator works best as a free agent, should have direct access to top management, and no immediate changes to the organization are necessary. True organizational change is an evolutionary process and should not be rushed.

4. Does the Coordinator Work Alone or Should an Outside Consultant be Hired?

The TQM coordinator selected from within the organization can do the entire job by himself if he has the proper credentials as discussed previously. If he does not, survey results indicate that combining the internal TQM coordinator with an external quality consultant to form a team is the best way to go.

It is a rare instance when an external consultant is not required. A very large organization may have an individual who has the traits needed in a TQM coordinator

and is also an expert in TQM and team building. The odds on having a person with this combination of skills are small, but these odds do increase as organizational size grows. If an organization has someone with these skills, he probably is self-educated in TQM. During interviews at Hewlett-Packard and NADEP, North Island, it was found that both of their coordinators were once involved in Quality Circles at their organizations. [Doxey; Hepler] These individuals had continued to maintain an active personal interest in quality management. They had gained technical competence in quality management by investing a considerable amount of their own personal time. Most organizations will not have an individual who has credibility in both its products and TQM. Because of skill deficiencies in the internal coordinator, hiring an external consultant to form a team becomes the logical starting point for a TQM implementation.

The team concept maximizes the advantages of both internal and external change agents, while minimizing their individual disadvantages. The internal TQM coordinator has the intimate knowledge of the organization's processes, products, people and politics to tailor the implementation to fit that organization. The hired external consultant is an expert in quality management theory, the quantitative tools of TQM, and teambuilding. The role of this external consultant is to bring credibility and technical competence to your TQM effort. The external consultant will work along

side the internal coordinator to train him and to initiate the implementation.

How does the organization find this TQM external consultant? With the tremendous recent increase in TQM interest by both DOD and civilian organizations, many TQM consultants have sprung up to ride the wave of TQM. Unfortunately, many of these consultants have contributed to TQM projects which met with an initial "false start"--a TQM implementation that did not work. When looking for a consultant, talk to other organizations who have had successful TQM implementations. Who did they use? Go for an external consultant with a proven track record of success. Go with quality and expect to pay for it. Hiring this external consultant is a test of an organization's commitment to devote the necessary resources to make TQM a success.

Because external consultants are expensive, it is important to consider how long their services will be needed. The length of time varies based on organization size and how long the internal TQM coordinator takes to get up to speed. The internal TQM consultant must become competent in the theory and tools of TQM, and the skills of teambuilding. Some organizations may feel they no longer need an external consultant in just a few months. Other organizations may require an external consultant for years.

My conclusion is that an external consultant is required by most organizations starting an implementation. The exception is if the organization has the rare individual who knows the organization and TQM. The external consultant is best used teamed with the internal coordinator. The external consultant should be used until the internal coordinator has learned enough about TQM and team building to stand on his own.

5. <u>Should the TQM Coordinator Have a Staff or Work Alone?</u>

The requirement for a TQM staff depends on the size of the organization and its geographic dispersion. As a minimum, the TQM coordinator will need a single secretary to handle routine correspondence and incoming calls when the coordinator is away from his desk. However, regardless of organization size, the total staff requirement is a tiny percentage of the total personnel.

Research proved that it is possible for the TQM coordinator to work alone, assuming the size of the organization permits it. Atn Hewlett-Packard, with 1200 employees, and in FAADCPAC, with 500 employees, a single TQM coordinator was able to handle a successful implementation without any staff. This was possible due to the relatively small size of both organizations and to the fact that all their employees were in single, multi-story buildings. [Doxey; Jordan] As the size of the organization grows, or if multiple sites are involved, the need for a TQM staff

grows. Because the survey was heavily biased by large organizations, it showed that over 80% of the organizations did have a TQM staff. While the actual size of the staff varied widely, research showed that it was approximately one tenth of one percent of the total people in the organization. The conclusion here is to keep the TQM staff as small as possible.

The requirement for a TQM staff should not be driven by the need to process paperwork. The TQM coordinator and his staff, if he has one, are there to be catalysts helping line managers make the changes desired by top management. The bulk of the paperwork should be handled by the people having ownership of the changes. Paperwork should flow through the normal organization structure and/or its quality team infrastructure. Line managers and quality teams should keep the coordinator informed of their progress and request his consulting assistance when required. The TQM coordinator should not assume a report processing and forwarding function in the chain of command.

Federal organizations frequently mentioned that they had part-time "facilitators" in addition to a TQM staff. These facilitators were from the various functional subdivisions inside the organization. They received more extensive training in quality management than an ordinary employee, particularly in the area of the quantitative tools of TQM, communications, and teambuilding. Facilitators

functioned in the departmental or division quality teams to aid in applying TQM to improving processes.

My conclusion is the need for a TQM staff increases as organization size and number of locations grows. A single TQM coordinator can handle a small organization. In large organizations, a staff is needed. A good rule of thumb for staff size is 0.1% of the number of people in the organization.

6. <u>What are the Sources of Resistance to Change?</u>

Research showed that resistance to change came primarily from management at all levels. Surprisingly little resistance came from actual workers. Many of the books on change agents and change management leave the impression that managers are usually behind the change and workers resist change. In reality, the reverse was true. Resistance in civilian and federal organizations was similar, but not exactly the same as the following sections will explain.

a. Resistance in Civilian Organizations

In civilian organizations, the sources of resistance most frequently mentioned were as follows.

(1) <u>Overall Management Resistance</u>. Overall management resistance was indicated by a lack of visible management action and continued support. This was reflected by management showing little enthusiasm, giving higher priority to some items, or simply being too busy to

concentrate on TQM. During the interview at General Dynamics, the point was made that the higher up the chain of command, the more the resistance. The increased resistance is due to greater risk to their careers if TQM was tried and proved unsuccessful. However, management resistance was more likely to be hidden by "smoke and mirrors." The smoke and mirrors meaning people who present the image of supporting TQM, but only because it is the politically smart thing to do. These people can talk TQM and have plenty of SPC charts on their walls. However, as soon as possible, it will go into the trash can because they really do not believe in the idea. [Dimitroff] The resistance becomes more subtle at higher levels in the chain of command.

(2) Top Management Resistance. Top management actually provided resistance to the effort inspite of themselves. This was surprising since in 75% of the civilian organizations studied, top management had been the initiator or "champion" of the quality effort. They understood the logic and proven benefits of quality management. Yet they provided a major source of resistance. They did this due to the paradigm shift of TQM. Top management would start the quality program fully intent on implementing it completely, and then fall back into the management style practiced all their lives. Virtually every TQM coordinator that was interviewed in this study had to go

into his boss and diplomatically tell him his actions did not match his words. This is a difficult position for a subordinate to be in. It requires courage in one's convictions, and the unswerving dedication to handle what could easily be a career-hazardous situation. The TQM coordinator is functioning here as the organization's conscience to ensure that top management's actions are a model for others to follow. A quote worth considering is by the ancient Chinese general Sun Zi who said, "Weak leadership can wreck the soundest strategy; forceful execution of a poor plan can often bring victory."

(3) <u>Middle Management Resistance</u>. In civilian corporations, middle management was the most frequent source of resistance. The reason behind their resistance was that top management and TQM coordinators, in their excitement to get started with the program, often failed to spend adequate time with middle management. Middle management resistance had its roots in the following four causes.

(a) Failure to create Quality Awareness. Middle management must be sold on the need for change. Teaching middle management the theory and tools of TQM is of little use if middle management is not convinced of the need to change. They often initially perceive there is no need to change due to their lower level in the organization, their satisfaction with existing processes, or their lack of financial or some other operating knowledge. Creating a

genuine "quality awareness" in them is a vital first step to overcoming their resistance. The interview at NADEP, North Island, made the point that the larger the organization, the more time is required to achieve quality awareness. [Hepler]

(b) Failure to Adequately or Effectively Train Them. The failure to adequately and effectively train middle management leads to resistance. The amount of training required to be adequate differs depending on the organization. For the training to be effective, middle management must have a good attitude toward the training. Any middle management indifference to the training must be overcome, and they must have quality awareness. There is no better way to create uneasy feelings and resistance than to have a worker with a bright idea for improving quality confront a middle manager who is unprepared for it.

(c) Lack of involvement. Failure to involve middle management in planning the changes causes resistance. For example, a frequent mistake was for top management's quality team to target a process to improve, tell middle management what to do, and start process improvement teams immediately. The problem with this approach was that middle management was circumvented. Therefore, they felt excluded and threatened by the change. They had no ownership in the program. Middle management's

lack of involvement in the effort leads to an attitude that "it's their program," not "it's our program."

(d) Change in management style. The most important source of middle management resistance was the realization that their old style of management was no longer appropriate or effective. This problem was apparent even in organizations where there was plenty of quality awareness, adequate training, and middle management participation in planning. Traditionally many middle managers have come up through the ranks. They know the processes that they manage. They tend to think they know the best way to do things, and they too often micro-manage workers and processes. This approach is not compatible with the TQM management philosophy. TQM stresses that the individual closest to the process is the source of the greatest ideas for improvements. Middle managers who are not supposed to manage in their old style are confused and their confusion is manifest by resistance to the change.

(4) Worker Resistance. The least resistance to the quality management effort in civilian companies came from the workers themselves. The training given the average worker was usually fairly brief and simple. The concept of using worker's ideas to improve all the companies processes was enthusiastically embraced by most workers. Although there will also be some people who simply will not accept change, the average worker readily accepted the ideas of

quality management. In fact, several coordinators said that workers were positively ecstatic--it was the first time anyone at work had ever asked their ideas on anything. Many workers previously felt like the old attitude was "park your brain at the door when you come to work, because you won't need it here." [Peters and Waterman]

The worker resistance to change that did occur was often a secondary effect. The initial excitement of workers with a good ideas turns to cynicism when their idea are rejected by an indifferent middle management, or when top management's actions did not follow the quality program verbally promoted.

b. Resistance in Federal Organizations

In federal organizations, the sources of resistance mirrored the ones given by their civilian counterparts, with the following two additions.

(1) Skepticism. One new form of resistance was skepticism generated by people at all levels of the organization who viewed TQM as "just another program." This answer was given frequently by federal organizations, yet it virtually never occurred in civilian answers. Closely related to this answer was the feeling that TQM was just another "buzzword." One coordinator reduced resistance by merely reducing the use of acronyms as monikers for the effort.

This skepticism in federal organizations is apparently the product of the high turnover rate in both military officers and government service employees, and "acronym overload." There is a distrust of programs because many turned out to be change for its own sake. In the past every new change in top management saw old policies go out and new ones come in. Federal workers have been bombarded with so many new programs with new monikers that they have become cynical and skeptical of all new programs.

The interview at FAADCPAC added a few amplifying thoughts to this. It is important that TQM not be advertised as a "program." If TQM is introduced as a way to reduce cost or produce more it will not appeal to people. This makes TQM sound like just another program, and spawns resistance. [Jordan]

(2) Full Plate Resistance. The second new source of resistance was aptly termed "full plate resistance" by several coordinators. This was resistance due to the fact that too many people already had a full schedule and workload. Overwork was cited as an obstacle to having time to learn TQM. This form of resistance was not mentioned by civilian organizations. Whether federal workers were really overworked is open to debate, but there was at least a strong self-perception that they were.

My conclusion is that management, in all forms, is the biggest source of resistance. Middle

management provides the most resistance and workers the least. In addition to the sources of resistance met by civilian firms, federal organizations must struggle to overcome "full plate" resistance and the idea that TQM is just another program.

7. <u>How Does the Organization Overcome Resistance to Change?</u>

There was no one central avenue to overcoming resistance to change. Organizations cited a myriad of different ways. Questions 21 and 22 in Chapter V provide a summary of the many different techniques used to overcome resistance and give an indication of the effectiveness of each. The most effective techniques were the following.

a. Use of a Formal Implementation Plan

A good way to minimize resistance is with a formal implementation plan. This plan should address both technical change and social change. The plan should anticipate resistance to change and plan ways to overcome it or, at least, reduce it. All levels of management should participate in the planning. Involvement in planning is the first step to ownership. This is especially critical for middle management. Involving a union representative in the planning is a good idea to get their support.

Formal implementation plans addressing both technical and social change were used in 80% of the organizations studied. The implementation plan was often included in the annual business or strategic plan. The

technical changes of TQM are the easiest to plan. Social
change is complex and involves a paradigm shift in thinking
and actions. As one survey aptly put it, "social change is
hard as hell."

Research indicated that the initial
implementation plan was frequently inadequate and
changedduring the implementation. However, the important
point is at least top management tried to plan.

b.   Adequate Time Spent on Quality Awareness and
     Training

Much resistance can be avoided if the
organization's people are made aware of the need for quality
management, and careful training in TQM is done. Quality
awareness is vital. Making a change always requires effort.
People are unwilling to put forth this effort until they are
convinced a change is needed. There are only two genuine
reasons why people change. They either perceive a need to
change or a benefit in changing. The TQM coordinator must
affect people's perceptions to ensure quality awareness.

Training should be done in steps. The first
step is to ensure the TQM coordinator is well trained. This
can be done with an external consultant, with schools and
courses, and with books and videos. Then top management
should be trained, followed by middle management, and
finally the workers. Many organizations cited failure to
adequately train middle management as a critical error. The
time spent training middle management should be fairly

substantial. An undertrained middle management can ruin an otherwise excellent implementation. As Goethe once said, "There is nothing more terrifying than ignorance in action."

c. Top Management Modeling

When an organization starts the actual quality effort, it is important that top management's actions provide a model for the rest of the organization to follow. Top management must be actively involved in the daily business of quality management. They must be willing to commit adequate resources, financial and otherwise, to support the effort. They should not allow other issues to overshadow quality. If they provide a model, the organizations people will follow. If they do not, no matter what they say, their actions will speak louder than their words. People believe in what they see.

d. Workforce Participation

The idea of involving workforce participation in planning changes to give the "ownership" in the changes is a good one. A similar concept is advanced in the Harold Bemis and Burt Nanus Book Leaders, The Strategies for Taking Charge. Bemis and Nanus talk about "empowering the workforce." The dictionary defines empower as to give power or authority to. Bemis and Nanus say empowering the workforce is when leaders instill vision, meaning, and trust in their followers. Individuals like to feel that they can make a difference in the organization. Trusting them and

empowering them with a compelling vision of TQM confers a higher status on them. People see themselves as a part of a worthwhile enterprise. They are transformed and bring vigor and enthusiasm to their work. [Bemis and Nanus] Human beings are empowered when they take the position that they have the ability to create their own world. They feel like that they own the processes and are responsible for them. They are transformed, their attitudes change, and resistance disappears.

e. Two-way Communications

Use of good two-way communications, particularly horizontal communications, is necessary to overcome resistance. Horizontal communications in an organization refers to communications between peers in the organization. The TQM coordinator will frequently be in the position of trying to influence his peers. It is difficult to handle horizontal communications without appearing threatening or manipulative. Response to question 39 provided a lot of good techniques for overcoming resistance. Some of the best of these included: the use of teams to improve participation, honest open communications, maintaining an advisor role, and offering assistance to help your peers meet their needs. Refer to Chapter V, Question 39 for other ideas.

f. Use of the Informal Culture

Using the informal culture is an another excellent way to overcome resistance. In every organization

there is an informal structure with strong opinion leaders. It is important to get these opinion leaders committed to the success of TQM, not fighting against it. The importance of seeking support from influential people in the informal culture to help sell and implement TQM was shown by the unanimous answer received to Question 42.

g.   Use of Legitimate Power

Current literature on the subject of the "change agent" consistently states that the least effective way to implement change is for top management to order change. However, during the interviews and on some of the surveys, successful attempts to reduce resistance by playing off of legitimate power were cited. [Doxey] The idea went like this: The chain of command is responsible for the TQM implementation, not the coordinator. The concept of TQM is implemented top down. Progress reports go from the bottom up. These reports are forwarded up the formal organization structure and or the quality management infrastructure. The TQM coordinator is responsible for acting as a catalyst to ensure the change progresses smoothly. Several TQM coordinators reduced resistance to the change by aiding people in accomplishing the quality effort directed by the chain of command.

The conclusion is that resistance to change can be overcome by a well executed implementation plan, by adequate quality awareness and training, and by top

management modeling. Resistance is also overcome by
involving the workforce, and by the use of both good two-way
communications and opinion leaders in the informal culture,
and by playing off of legitimate power.

    8.   <u>How is the Success of the TQM Coordinator Measured?</u>

      The success of the TQM coordinator in this study
seemed to be inexorably tied to the success of the TQM
effort. Looking first at overall success of TQM, it can be
measured either quantitatively, by production, financial,
and other numbers, or qualitatively by customer comments,
employee satisfaction, and team or goal orientation.
Civilian and federal organizations differed on how they
measured success. Seventy percent of civilian firms used
both quantitative and qualitative measures. Conversely, the
majority of federal organizations used qualitative measures.
This seems to be a reflection of the fact that 86% of
federal organizations viewed themselves as being in a
service business and qualitative measures were an easier way
to gauge their results.

      Another method for judging the success is the cost
of quality. Civilian organizations were extremely
interested in the cost of quality and had a lot of different
approaches for measuring it. Question 24 lists some of
their ideas. On the same question, federal firms made
absolutely no comments on cost of quality. In fact, 63%
said that they do not measure it at all. Again this is

probably a result of the high percentage of federal organizations whose primary business is service. It may also be a reflection of the relative lack of importance placed on costs due to the absence of the profit motive in the federal government.

Measuring the success of the TQM effort is not exactly the same as measuring the success of the coordinator. However, most organizations studied were new enough to TQM, that at this stage, they were unable to separate the two.

Most quality management theories give another way to measure the success of the coordinator. They suggest that the ultimate success for a TQM coordinator is achieved when TQM is institutionalized in the organization. During the interview with the TQC coordinator at Hewlett-Packard, he said their goal was institutionalizing TQM. [Doxey] Institutionalizing means that the principles of TQM are so ingrained in the organization that they become second nature and the coordinator is no longer needed. Success is when the TQM coordinator works himself out of a job. Captain Tom O'Connor, commanding officer of NADEP North Island drove home this point when he said,

> True and complete implementation of TQM will have occurred when we stop talking about it as a special item and our culture has changed to the point that using TQM principles and living its philosophy are the natural way we do business. I remain fully convinced that our culture change must happen to make TQM implementation a reality. [O'Connor]

Question 27 also looked at institutionalization, and asked
if the coordinator's position was permanent or temporary.
Although the majority of the organizations chose permanent,
the answer is undoubtly biased by their relatively brief
experience with TQM. It takes a long time to
institutionalize TQM. A significant number of the
organization admitted that they just did not know yet.

My conclusion is that short term success can be
measured either qualitatively or quantitatively. For
civilian organizations, the cost of quality is an important
measure. Federal organizations did not know how to measure
themselves quantitatively when it came to quality. However,
the true success of the TQM coordinator requires long term
evaluation. For virtually all the organizations in this
study, long-term results are not in.

D. SUMMARY

The implementation of Total Quality Management involves
a major change, a paradigm shift, in our management
philosophy. Implementing TQM requires the use of a change
agent to act as a catalyst to change the organization.

My research identified seven criteria to use in
selecting the TQM Coordinator. The TQM Coordinator is best
placed in the organization as a free agent with access to
all levels in the organization. The most effective approach
to implementing TQM is to use an internal TQM Coordinator
and a hired consultant as a team. A staff is required to

119

support the TQM Coordinator, but it is tiny, generally 0.1%
of the organization's people.

This thesis covered in depth the types of resistance to
TQM and ways to overcome that resistance. However, there is
no easy solution. As Joseph M. Juran has said, "Dealing
with resistance to change will always be an art." Measuring
the success of a TQM implementation can be done either
qualitatively or quantitatively. When implementing TQM and
measuring success, a good quote to remember is the following
one by Winston Churchill, "Success isn't final; failure
isn't fatal; it's courage that counts."

When I began this thesis, there were precious few
guidelines to assist an organization in selecting and using
a TQM coordinator. Although this thesis provided an answer
to each of the eight research questions posed in Chapter I,
no one has all the answers. The application of TQM Requires
that it be tailored to fit the organization.

The conclusions reached in this thesis are an accurate
reflection of the collective thoughts of the organizations
studied. However, they are based on the organization's
present state of TQM development and will surely evolve as
the organizations gain experience.

E. RECOMMENDATIONS FOR FUTURE STUDY
During the research on the role of the TQM coordinator,
peripheral issues surfaced which would be good topics for

future study. These TQM-related topics are briefly
mentioned.

1. Appraisal, Evaluation, Recognition, and Reward
    Systems

Use of an established, but inappropriate reward and
punishment system, or an inappropriate appraisal or
evaluation system will deter or prevent changes in behavior
necessary for TQM. This topic could consider the Japanese
use of group cooperation and reward versus the American
system of individualistic competition. Tieing TQM to
promotion and compensation plans could be explored. Are
federal civilian personnel regulations compatible with TQM?
Are enlisted evaluations and officer fitness reports
compatible? What are the best motivators and incentives to
use with TQM? How is corporate strategy reinforced by
compensation policies?

2. Procurement and Contracting

Can TQM be integrated into the Competition in
Contracting Act (CICA)? Should the government require
contractors and subcontractors to use TQM, and, if so, how
does it tell them what to do? Do civilian quality programs
for suppliers, like Ford Motor Company's Q-1 Program, have a
place in government contracting?

3. TQM Implementation

A good follow-on topic to the research done in this
thesis on the TQM coordinator is to study the implementation
itself. What implementation plan is used? Who gets

trained, what are they trained, and how long are they
trained? Are facilitators used and, if so, what are their
responsibilities? How long should the implementation last?

APPENDIX A

QUALITY MANAGER SURVEY/QUESTIONNAIRE

Directions: This questionnaire is meant to be filled out by
the person who is in charge of your quality management
effort. Most of the questions have the answers already
listed, and you can check off the appropriate block(s). For
questions which require written responses, space has been
provided. If more writing room is required, please use the
back of the page. Complete sentences are not required
unless you prefer them. If you would like to add any
additional comments on any question, feel free to do so.

Background Data:

Name of Company or Military Command: _____ .

Primary business: __ Manufacturing
                  __ Service
                  __ Sales (or providing products)
                  __ Other (please specify):_____ .

Number of Employees: __ 1 to 500   __ 501 to 1000
                     __ 1001 to 1500   __ 1501 to 2000
                     __ 2000 or more

Your employees are in which category: (please give
approximate percentage)
        _____ % Military
        _____ % Government Service (federal/state/ or local)
        _____ % Civilian

What is the name used to describe your quality effort?
   __ Total Quality Control   (TQC)
   __ Total Quality Management   (TQM)
   __ Company-Wide Quality Control (CWQC)
   __ Zero Defects   (ZD)
   __ Quality Improvement Process   (QIP)
   __ Quality Control   (QC)
   __ Program has no formal name
   __ Other (please
specify):_____
_____ .

Do you have a "traditional" Quality Control Department which
does procedures such as final product inspections/sampling,
Acceptable Quality Level (AQL) Testing, etc.?
   __ No - (go to next question)
   __ yes - if so, What size is the Quality Control
            Department now compared to before you went to
            quality management?
                              __ Smaller
                              __ Larger
                              __ Same size

How does your company define Quality Management?_____
_____
_____

Does your company emphasize the quality theory or teachings
of any particular individual(s) in its quality management
effort?
_____
_____
_____.

How long has your organization pursued quality management?
_____.

Motivation to Pursue Quality Management:

Why did your organization pursue Quality Management?   (Check
off all appropriate answers)
   __ To remain competitive/Competitive Pressure
   __ To improve productivity and reduce costs
   __ Enlightened management pursuing an improved
        organization
   __ A crisis in the organization (decline in sales, market
        share, and/or financial position)
   __ To handle budget cuts and remain in business
   __ Other (please specify):_____.

Who was the initiator or "champion" of quality in your
organization? (This is the one with the idea, not who is
doing the day-to-day implementation)
   __ Top Management (CEO/General Manager/Commanding
                       Officer/Executive Officer)
   __ Middle Manager (division/department Head)
   __ Supervisor   (first level management)
   __ Worker

124

Implementation Data:

Was Quality Management implemented at your company by:
__ External quality consultant--hired to do the implementation
__ Internal quality consultant--an "in-house" member of your organization trained in such areas as quality, statistics, and/or organizational development
__ A team approach (combining both internal and external consultants)
__ Other approach (please explain):_____
_____.

Did your internal/external/or team consultants work by themselves to do the implementation or were they assisted by a staff?
__ Yes, the staff had ____ number of people
__ No, they worked by themselves

How many fulltime employees are in your quality management staff? _____. How many part-time? _____.

To what degree has your organizational structure changed as a result of your quality management effort? (Changes in organizational structure could include such areas as altering the chain of command, changing the number of levels of management, and/or changing the reporting relationships).
__ No change in organizational structure due to the quality management effort
__ Minor changes to organizational structure
__ Major overhaul of the organization structure.

What is the main emphasis of your organization's quality management effort?
__ <u>Product-oriented:</u> traditional inspection-oriented effort, with most controls and activity in a quality assurance organization
__ <u>Process-oriented:</u> continuous improvement-oriented effort, with responsibility and activity distributed throughout the organization
__ <u>Quality-of-work-life:</u> activity focused principally on human factors, with less emphasis on direct relation to an organization's product or service.
__ Other (please describe) _____
_____
_____.

Was a formal implementation (change) plan written and used?
____ yes ____ no

Training:

Which of your employees has received (or will receive) some type of quality training, regardless of the degree of training?
    __ Everyone--Top Management to Lowest level
    __ The following: (mark as many as appropriate)
        __ Top Management
        __ Middle Management
        __ Supervisors (first level)
        __ Workers
        __ Quality Manager
        __ Quality Staff

How are they trained? (mark as many as appropriate)
    __ Sent to schools/classes/courses <u>outside</u> of the
        organization
    __ Within the organization by an hired <u>external consultant</u>
    __ Within the organization by an <u>internal</u> "in-house"
        <u>consultant</u>
    __ Self-study with books, videos, and work group meetings
    __ Other (please specify):_____.

How does your organization's regular training department fit into your implementation plans?
    __ As a team with Quality Management Staff
    __ Will provide continuity and training after the
        implementation period is over
    __ Provides only specific training (such as statistics)
    __ Training department not used at all
    __ Do not have a training department
    __ Other (please specify):_____.

Implementation Problems:

Do you try to anticipate "resistance to change" and plan/prepare to overcome or reduce it?
    __ No--go to next question
    __ yes--if so, does your plan address:
        Technological Change: The effect on the machines,
            products, and procedures. __Yes __No.
        Social Change: The effect on the people involved,
            and their cultural habits, beliefs, and
            status. __Yes __No.

Which of the following techniques do you use to overcome resistance and "sell" the need for change?   For each one that you used, rate the effectiveness on a scale of 1 to 5.

126

```
     1 = not effective    2 = somewhat effective
     3 = effective        4 = very effective
     5 = extremely effective
```

_____ Bring in an outside expert to inspire employee
      confidence
_____ Thorough employee training up front
_____ Strong two-way communications--good feedback
_____ Involve work force participation in planning changes
      to give them "ownership" in the changes
_____ Address and reduce "fears" that people have about the
      changes up front. These fears include fear of
      income or status reduction, job security, worries
      about learning new skills such as statistics, and
      worries about spending more time at work.
_____ Appeal to individual or departmental self-interest
      (show them "what's in it for me.")

```
     1 = not effective    2 = somewhat effective
     3 = effective        4 = very effective
     5 = extremely effective
```

_____ Utilizing influential people in the informal
      organization
_____ Use a pilot project and publicize its success
_____ Quick action on worker suggestions to improve your
      product or quality of work life
_____ Give credit to the people who make the improvements
_____ Seek no recognition for yourself (as quality
      implementor) or for your quality staff. Be humble.
_____ Tell workers to remain skeptical and watchful until
      management actions match their statements on
      quality.
_____ Other (please specify. Use reverse if more room
      needed):
      _____.

What provided the most resistance to your quality management
efforts and how have you overcome that resistance? (use
reverse if more room needed).

_____
_____
_____
_____.

Measuring Success:

A customer is anyone who receives the benefits of your work.
A Customer can be external or internal to your organization.
How do you get "Customer Feedback" on your quality
improvement?

__ Market surveys
      __ Level of complaints
      __ Internal customer reports
      __ Meetings with workers/supervisors
      __ Other (please Specify):_____.

How do you figure the <u>Cost of Quality</u>?
      __ Amount of scrap and rework
      __ Number of failures
      __ Complaints from customers
      __ We don't measure it
      __ Other (please specify):_____.

How does your organization measure the success (or progress)
of your quality program?
      __ Primarily <u>quantitatively</u>--by production, financial, and
          other numbers
      __ Primarily <u>qualitatively</u>--by customer comments and
          feedback, employee satisfaction, teamwork, and goal
          orientation
      __ Both quantitatively (___%) and qualititatively (___%)

Has an independent evaluator (from outside of your
organization) ever been used to judge the success (or
progress) of your implementation?   __ Yes   __ No

Is your Quality Management Implementor (and/or staff) a
<u>permanent</u> part of your organization, or will your
organization reach a point when Quality Management is
"institutionalized/internalized" and the implementor (and/or
staff) are no longer required?
      __ Permanent. A Quality Management Staff is always
          needed.
      __ Temporary. The Quality Management staff will be
          dissolved and other department(s) will do future
          training and monitoring.

<u>Quality Management Implementor Data:</u>

How long have you been in your current position as the
Quality
Implementor/Facilitator/Coordinator?_____.

What is the title of your position? _____
_____.
Are you: __ Military __ Government Service   __ Civilian

Was your previous job from a "line" organization (which
produces your principal product or service) or a "staff"
organization (which supports the line organization)?
      __ Line   __ Staff

What level are you in the organization?
___ Top Management (CEO/General Manager/Commanding
      Officer/Executive Officer)
___ Middle Manager (division/department Head)
___ Supervisor   (first level management)
___ Worker

What kind of <u>access</u> do you have to the CEO/President/General
Manager (for civilian companies) or to the Commanding
Officer (for military)? Mark all appropriate answers.
___ Direct access
___ Access via one organizational level (such as starting
      with a vice-president, or executive officer)
___ Access via two organizational levels (such as starting
      with a division or department head)
___ Access through three organizational levels <u>or more</u>

What level of access would you recommend to another quality
manager and why?

_____
_____
_____.

When picking someone to be a Quality Implementor or
Facilitator, what personality traits, characteristics, and
qualities are important? Please rate the following on a
scale of 1 to 5:

	Not Important	Below Average	Average	Above Average	Critically Imp.
Knowledge of your Company's Business	1	2	3	4	5
Knowledge of Statistics	1	2	3	4	5
Knowledge of Behavioral Science/ Organizational Development	1	2	3	4	5
Theoretical understanding of Quality Management	1	2	3	4	5
Formal <u>Position Power</u> in the Organization	1	2	3	4	5

Established Credibility/ Competence in your Organization	1	2	3	4	5
Political Savvy	1	2	3	4	5
Participative Management Style	1	2	3	4	5
Interpersonal Skills	1	2	3	4	5
Writing Skills	1	2	3	4	5
Speaking Skills	1	2	3	4	5
Listening Skills	1	2	3	4	5
Imagination/ Innovative Ability	1	2	3	4	5
Dynamic Personality	1	2	3	4	5
Intelligence	1	2	3	4	5
Motivation/Initiative	1	2	3	4	5
Self-confidence, self-assuredness	1	2	3	4	5

If you were picking a Quality Implementor for another organization similar to your own, what four traits or characteristics would be most important to you? These may or may not be from the previous question. Please list four and then rank them, with number 1 being the most important.

Trait/Characteristic   Rank

_____   _____
_____   _____
_____   _____
_____   _____

How have you achieved technical competence in Quality Management?
    __ Self-study
    __ Formal course or school
    __ Training by another Quality Manager
    __ On-the-job training (OJT)
    __ Other (please specify):_____.

How have you established <u>credibility</u> in your organization?
__ Formal position power in the organization.
__ You were an external expert
__ Access to top management
__ Previous reputation in the organization
__ Other (please specify): _____.

How do you manage "horizontal communications" (to peers in the organization) without appearing threatening or

_____
_____
_____
_____
_____.

How do you achieve and keep the "Big Picture" of your organization?
__ Liaison with top management
__ You are part of top management
__ Access to strategic planning process
__ The "Big Picture" is not important
__ Other (please specify): _____.

Do you think it is necessary to seek support from influential people in the <u>informal</u> <u>culture</u> of your organization to help "sell" and implement your program?
____ yes   ____ no

If you have any additional comments that you would like to make on anything in the survey, please add them here: (Use reverse if more room desired)
_____
_____
_____
_____
_____
_____
_____.

Executive Summary:

I will provide an <u>Executive Summary</u> of my thesis to your organization. If you have a special address and division/code to which you would like the summary mailed, please list it here:

_____
_____
_____
_____

<u>**THANK YOU VERY MUCH**</u>
<u>**for taking time out of your busy day**</u>
<u>**to fill out this questionnaire.**</u>

APPENDIX B

SURVEY RESPONDENTS

I. Surveys returned from the following 60 organizations were used as the basis for numerical averages in Chapter V:

A. CIVILIAN ORGANIZATIONS

Adolph Coors Brewing Company

American Telephone & Telegraph Company

Tom Barry Associates, Inc.

Caterpillar Inc.

Chrysler Motors Corporation

Corning Glassworks

Philip Crosby Associates Inc.

Digital Equipment

Douglas Aircraft Company

Eastman Kodak Company

Ford Motor Company

Florida Power and Light

General Dynamics, Land Systems Division

General Dynamics, Space Systems Division

General Motors Company

Harvard University

Hewlett-Packard, San Diego Division

Hewlett-Packard, Data Systems Division

IBM Corporation

Intel Corporation

Kaizen Institute

McDonnell Aircraft Company

Metropolitan Life Insurance Company

Motorola Inc.

Rohr Industries Inc.

Texas Instruments

3M Company

VOTAN

Weyerhaeuser Paper Company

Xerox Corporation

B. FEDERAL ORGANIZATIONS

Headquarters, Air Force Logistics Center (Code MA), Wright
    Patterson AFB

Headquaters, Air Force Logistics Center (Code QP), Wright
    Patterson AFB

Naval Aviation Supply Office

Chief of Naval Operations (OP-40B)

Defense Construction Supply Center

Defense Electronics Supply Center

Defense Industrial Supply Center

DEMCOM Consulting

Fleet Accounting and Disbursing Center, Pacific

Internal Revenue Service

Marine Corps Logistics Base, Albany, Georgia

Naval Aviation Depot, Cherry Point

Naval Aviation Depot, Jacksonville

Naval Aviation Depot, Norfolk

Naval Aviation Depot, Pensacola

Naval Aviation Depot, San Diego

Naval Air Systems Command

Defense Depot, Memphis

Defense Depot, Tracy

Naval Aviation Maintenance Office

Naval Sea Support Center, Pacific

Naval Systems Sea Command (Code CHENG-QD)

Naval Supply Center Oakland

Naval Supply Center San Diego

Naval Weapons Support Center

Office of Assistant Secretary of Navy (Shipbuilding and

Logistics)--SPECAG

David Taylor Research Center

Aeronautical Systems, Wright Patterson AFB

Headquarters, Marine Corps

II. Surveys returned from the following organizations were
read for comments, but not included in the numerical
averages:

Control Data

E. I. Du Pont De Nemours & Company

Defense Personnel Supply Center

Defense Systems Management College

General Electric Aircraft Engines

Harley-Davidson

Johnson & Johnson

Marriott Hotels & Resorts

Naval Supply Center Pensacola

Naval Supply Systems Commar.d

Naval Sea Systems Command (Code SEA 07Q)

Office of Assistant Secretary of Defense (Production and
    Logistics)

San Diego State University

UNISYS Corporation

APPENDIX C

EXPLANATION OF STATISTICAL PROCESS CONTROL

Statistical Process Control (SPC) is a type of control chart. Data on a particular process is tracked over a period of time to look for trends. The chart has upper and lower control limits which have been statistically determined from the process average. [Walton] A typical SPC control chart looks like this:

Statistical Process Control Chart
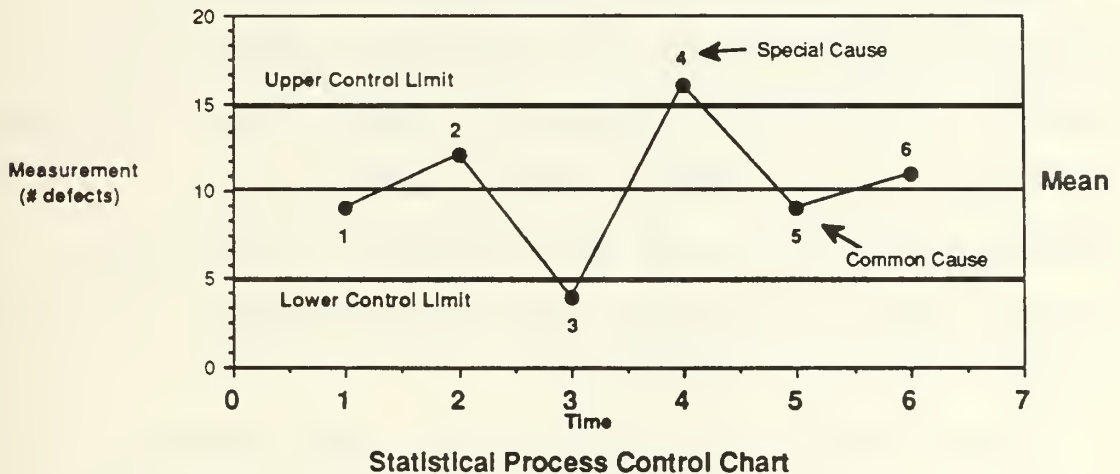
Source: [Walton]

The purpose of the SPC control chart is to allow management and workers to control variation in the process. There are two key types of variation:

137

A. COMMON CAUSES

These are the normal, predictable variations in a process such as variations in raw materials, variations in worker training and capacity, machine tolerance, and human variation in reading instruments. Common causes are the natural variation present in even stable processes. Points 1, 2, 5, and 6 on the chart are due to common causes. Common causes may be reduced only by changing the basic system that produces the product.

B. SPECIAL CAUSES

These are the abnormal, unexpected variations in a process such as defective raw materials, an untrained operator, or machine malfunctions. Points 3 and 4 are due to special causes. Special causes result from an abnormality in the system that prevents a process from becoming stable and require worker and management action to correct. [DOD Inst 5000.51-G]

If the control limits are set too tight, management will search for a special cause when the cause is only normal variation. If the control limits are set too loose, a special cause may actually exist and management will ignore it. There must be an economic balance to determine how often management action is required.

Once management has a process running smoothly between the control limits, it is called "in control." Monitoring

SPC charts will allow immediate detection when a problem occurs. [Walton]

There are three potential drawbacks to be aware of when using SPC. One drawback is that although the SPC technique is easy to learn, the difficulty is in deciding what characteristic of the process to measure, how to measure it, and how often to measure it. [Jordan] A second drawback is it is all too easy to overuse SPC. It does not fit all problems. An old proverb pertains here, "If the only tool you have is a hammer, it is surprizing how many things start looking like a nail." [Scherkenbach] The third drawback is that SPC can cause managers to look at the organization only in pieces and suboptimize the overall organization. SPC is a good tool, but it must be used properly.

LIST OF REFERENCES

[Atkinson] Atkinson, Phillip E., "Who Should Manage Change?" _Personnel_, Vol. 29, No. 2, February 1985, pp. 14-15.

[Bennis and Nanus] Bennis, Warren, and Nanus, Burt, _Leaders, The Strategies For Taking Charge_, Harper and Row, New York, 1985.

[Boudreaux] Boudreaux, J.C., "Total Quality Management: A DOD Example," _Program Manager_, Vol. 27, No. 4, July-August 1988.

[Brueland] Brueland, Major Ray G., _Managing the Near Term Functions of Change in Medical Units_, Master's Thesis, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, June 1986.

[Burchill] Burchill, Gary W., Director, Systems Integrity, Naval Supply Center San Diego, California. Interview, March 31, 1989.

[Carlucci] Carlucci, Frank, "Department of Defense Posture on Quality," Secretary of Defense Memorandum, dated March 30, 1988.

[Caruth] Caruth, Dr. Donald L., "Basic Psychology For a Systems Change," _Journal of Systems Management_, Vol. 25, No. 154, February 1974, pp. 10-13.

[Control Data Corporation] Control Data Corporation, _Quality Management In Control Data_ (Booklet), 1988.

[Crosby 82] Crosby, Phillip B., "The Management of Quality," _Research Management_, Vol. 25, No. 4, July 1982, pp. 10-12.

[Crosby 79] Crosby, Phillip B., _Quality is Free_, McGraw-Hill, New York, 1979.

[Deming 86] Deming, W. Edwards, _Out of Crisis_, Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, 1986.

[Deming 82] Deming, W. Edwards, _Quality, Productivity, and Competitive Position_, Massachusetts Institute For Advanced Engineering Study, Cambridge, 1982.

[Dimitroff] Dimitroff, Gail R., Total Quality Management
     Specialist, General Dynamics, Space Systems Division,
     San Diego, California. Interview, March 31, 1989.

[Dockstader] Dockstader, Steven L., Naval Personnel Research
     and Development Center, San Diego, California. Interview
     January 6, 1989.

[DOD TQM Orientation] Carlucci, Frank, Costello, Robert,
     Scherkenbach, William, and Strickland, Jack, "Total
     Quality Management, an Orientation for Senior DOD
     Mangers," 1988, Video.

[DOD Inst 5000.51-G)] Department of Defense Instruction
     5000.51-G., Total Quality Management, a Guide for
     Implementation, Department of Defense, Washington, DC,
     Draft Copy Dated February 1, 1989.

[Doxey] Doxey, Jack, Training-Quality Assurance, Hewlett-
     Packard, San Diego Division, San Diego, California.
     Interview, March 27, 1989.

[Frick] Frick, Harry L., Increased Productivity Through
     Quality Improvement, Army Management Engineering
     College, Rock Island, Illinois, 1988.

[Fiegenbaum 87] Fiegenbaum, Armand V., "Quality Is
     Universal," Quality, Anniversary Issue, 1987, pp.40-42.

[Fiegenbaum 83] Feigenbaum, Armand V., Total Quality
     Control, McGraw-Hill Book Company, New York, 1983.

[Gibson] Gibson, Thomas C., "The Total Quality Management
     Resource," Quality Progress, Vol. 20, No. 11, November
     1987, pp. 62-66.

[Grossman] Grossman, Lee, The Change Agent, Amacon, New
     York, 1974.

[Guest] Guest, Robert H., Organizational Change, the Effect
     of Successful Leadership, The Dorsey Press, Homewood,
     Ilinois, 1962.

[Gluckstern and Packard] Gluckstern, Norma B. and Packard,
     Ralph W., "The Internal-External Change Agent Team,"
     The Journal of Applied Behavioral Silence, Vol. 13, No.
     1, January-February-March 1977, pp. 41-52.

[Hepler] Hepler, Gene, TQM Manager, Naval Aviation Depot,
     North Island, San Diego, California. Interview, March
     27, 1989.

[Hill] Hill, Michael, "The Manager As Change Agent,"
    Personnel Journal, Vol. 50, No. 1, January 1971, pp. 60-
    63.

[Hodgson] Hodgson, Alan, "Deming's Never-Ending Road To
    Quality," Personnel Management, July 1987, pp. 40-44.

[Holmes] Holmes, William F., "Preparing For Change,"
    Administrative Management, Vol. 31, No. 10, October
    1970, p. 80.

[Hunsaker] Hunsaker, Phillip L., "Strategies For
    Organization Change: The Role of the Inside Change
    Agent," Personnel, September-October 1982, pp. 18-28.

[Imai] Imai, Masaaki, Kaizen: The Key To Japan's
    Competitive Success, Random House, New York, 1986.

[Imaizumi] Imaizumi, Masumasa, "Past and Present Status
    of Quality Management in Japan," Management Japan, Vol.
    16, No. 1, Spring 1983, pp. 18-22.

[Ishikawa 85] Ishikawa, Kaoru, What is Total Quality
    Control? The Japanese Way, Prentice-Hall, Inc.,
    Englewood Cliff, New Jersey, 1985.

[Ishikawa 82] Ishikawa, Kaoru, Guide to Quality Control,
    Asian Productivity Organiztion, Tokyo, 1982.

[Jordan] Jordan, Patrick W., Management Analyst, Fleet
    Accounting and Disbursing Center Pacific, San Diego,
    California. Interview, March 31, 1989.

[Juran 64] Juran, Joseph M., Managerial Breakthrough: A
    New Concept of the Manager's Job, McGraw-Hill, New York,
    1964.

[Juran 51] Juran, Joseph M., Gryna, Frank M., and Bingham,
    R.S., Quality Control Handbook, 3rd Edition, McGraw-
    Hill, New York, 1951.

[Juran and Gryna] Juran, Joseph M., and Gryna, Frank M.,
    Quality Planning and Analysis, McGraw-Hill Book Company,
    New York, 1980.

[Kanter] Kanter, Rosabeth Moss, The Change Masters, Simon
    and Schuster, New York, 1983.

[Lancourt] Lancourt, Joan, Developing Implementation
    Strategies, Boston University Center For Health
    Planning, Boston, Massachusetts, 1979.

[Lippitt] Lippitt, Gordan L., Organization Renewal: A
    Holistic Approach To Organization Development, Prentice
    Hall, Englewood Cliff, New Jersey, 1982.

[Management Review 72] (No author given), "How Companies
    Overcome Resistance to Change," Management Review, Vol.
    61, No. 11, November 1972, pp. 17-25.

[Margulies and Raia] Margulies, Newton and Raia, Anthony
    P., Organizational Development, McGraw-Hill Book
    Company, New York, 1972.

[Margulies and Wallace] Margulies, Newton and Wallace,
    John, Organizational Change, Scott, Foresman and
    Company, Glenview, Ilinois, 1973.

[McMillan] McMillan, Charles J., "From Quality Control to
    Quality Management: Lessons from Japan," Business
    Quarterly, Vol. 47, No. 1, Spring 1982.

[Mishne] Mishne, Patricia P., "A New Attitude Toward
    Quality," Manufacturing Engineering, Vol. 101, No. 4,
    October 1988, pp. 50-55.

[Menkus] Menkus, Belden, "Systems Change," Journal of
    Systems Management, Vol. 29, No. 6, June 1978, pp. 11-
    13.

[O'Connor] O'Connor, Tom, "Captain's Corner," Depotalk
    (NADEP North Island), Vol. 15, No. 5, March 15, 1989.

[Pascarella] Pascarella, Perry, "Snapping Out of the
    Organizational Trance," Industry Week, Vol. 229, No. 2,
    April 28, 1986, pp. 53-60.

[Pavsidis] Pavsidis, Constantine, "Total Quality Control:
    An Overview of Current Efforts," Quality Progress, Vol.
    17, No. 9, September 1984, pp. 28-29.

[Peters and Waterman] Peters, Thomas J., and Waterman
    Robert H, Jr., In Search of Excellence, Warner Books,
    New York, 1982.

[Rehder and Ralston] Rehder, Robert, and Ralston, Faith,
    "Total Quality Management: A Revolutionary Management
    Philosophy, " Advanced Management Journal, Vol. 49, No.
    3, Summer 1984.

[Rehder and Smith] Rehder, Robert R., and Smith, Marta
    Medaris, "Kaizen and The Art of Labor Relations,"
    Personnel Journal, Vol. 65, No. 12, December 1986, pp.
    83-93.

[Schein] Schein, Virginia E., "Organizational Realities: The Politics of Change," <u>Training and Development Journal</u>, Vol. 39, No. 2, February 1985, pp. 37-41.

[Scherkenbach] Scherkenbach, William W., "The Meaning of Competitiveness," Keynote Address, SPC International Conference, London, England, June 16, 1987.

[Scholtes] Scholtes, Peter R., <u>The Team Handbook; How to Use Teams to Improve Quality</u>, Joiner Associates, Inc., Madison, Wisconsin, 1988.

[Shewhart] Shewhart, Walter A., <u>The Economic Control of Quality of Manufactured Product</u>, Van Nostrand, New York, 1931.

[Suzawa] Suzawa, Shoichi, "How the Japanese Achieve Excellence," <u>Training and Development Journal</u>, Vol. 2, No. 2, May 1985, pp. 110-117.

[Taguchi] Taguchi, Genichi, <u>Introduction to Off-Line Quality Control</u>, Central Japan Quality Control Association, 1980.

[Tribus] Tribus, Myron, <u>Reducing Diming's 14 Points to Practice</u>, Massachuetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, Massachusetts, 1984.

[Walton] Walton, Mary, <u>The Deming Management Method</u>, Perigee Books, New York, 1986.

[Wagel] Wagel, William H., "Corning Zeroes in on Total Quality," <u>Personnel</u>, Vol. 64, No. 7, July 1987, pp. 4-9.

INITIAL DISTRIBUTION LIST

Number of Copies

1. Defense Technical Information Center   2
   Cameron Station
   Alexandria, Virginia 22304-6145

2. Library, Code 0142   2
   Naval Postgraduate School
   Monterey, California 93943-5002

3. Dr. David Garvin   1
   Graduate School of Business
   Harvard University
   Cambridge, Massachusetts 02138

4. Dr. Milton M. Chen   1
   College of Business Administration
   San Diego State University
   San Diego, California 92182-0127

5. RADM John Kirkpatrick   1
   Office of Assistant Secretary of Defense
      (Production and Logistics)
   Room 3E144, The Pentagon
   Washington, D.C. 20301-5000

6. Mr. Joseph A. Bizup   1
   Deputy Director, Joint & Oper. Logistics
   Chief of Naval Operations (OP-40B)
   Room 4B546
   Washington, D.C. 20350-2000

7. Mr. Steve Slocomb   1
   Sup 001
   Naval Supply Systems Command
   Crystal Mall #3
   Washington, D.C. 20376

8. Dr. Laurie Broedling   1
   Code 16
   Navy Personnel Research & Dev. Center
   San Diego, California 92152-6800

9. Mr. G.C. Hoffmann   1
    Specification Control Adv. Gen. of the Navy
    Department of the Navy
    Office of Assistant Secretary
       (Shipbuilding & Logistics)
    Washington, D.C. 20360-5000

10. Commanding Officer   1
    Fleet Accounting and Disbursing Center, Pacific
    Code AR-4, Mr. Patrick W. Jordan
    937 Harbor Drive
    San Diego, California 92132-5111

11. Commanding Officer   1
    Naval Supply Center San Diego
    Code 80
    937 Harbor Drive
    San Diego, California 92132-5044

12. Mr. Gene Hepler   1
    Naval Aviation Depot
    NAS North Island
    San Diego, California 92135-5112

13. CDR E. Neil Hart, Code 54Hr   1
    Department of Administrative Sciences
    Naval Postgraduate School
    Monterey, California 93943-5000

14. Benjamin J. Roberts, Code 54Ro   1
    Department of Administrative Sciences
    Naval Postgraduate School
    Monterey, California 93943-5000

15. LCDR Raymond W. Smith, Code 54Sx   1
    Department of Administrative Sciences
    Naval Postgraduate School
    Monterey, California 93943-5000

16. Daniel Trietsch, Code 54Tr   1
    Department of Administrative Sciences
    Naval Postgraduate School
    Monterey, California 93943-5000

17. Defense Logistics Studies Information Exchange   2
    U.S. Army Logistics Management Center
    Fort Lee, Virginia 23801

18. Mr. Tom Barry   1
    Tom Barry Associates Inc.
    430 Virginia Avenue
    Salisbury, Maryland 21801

146

19. David B. Luther   1
    Senior Vice President, Quality
    Corning Glass Works
    Corning, New York   14831

20. Dr. Gail R. Dimitroff   1
    General Dynamics, Space Systems Division
    P.O. Box 85990
    San Diego, California   92138

21. Mr. Jack Doxey   1
    Hewlett-Packard, San Diego Division
    16399 W. Bernardo Drive
    San Diego, California   92127-1899

22. Dr. Nick Schacht   1
    Logistics Management Institute
    6400 Goldsboro Road
    Bethesda, Maryland   20817-5886

23. LCDR Kim F. Kline   1
    TQM Manager
    Defense Electronics Supply Center
    Wilmington Pike
    Kettering, Ohio   45444-5000

24. Captain Keith Nyenhuis   1
    7900 Cinthia Street
    La Mesa, California   92041

25. National Technical Information Service   1
    5285 Port Royal Road
    Springfield, Virginia   22161

26. LCDR Larry W. Johnston   2
    Navy Supply Corps School
    Athens, Georgia   30606